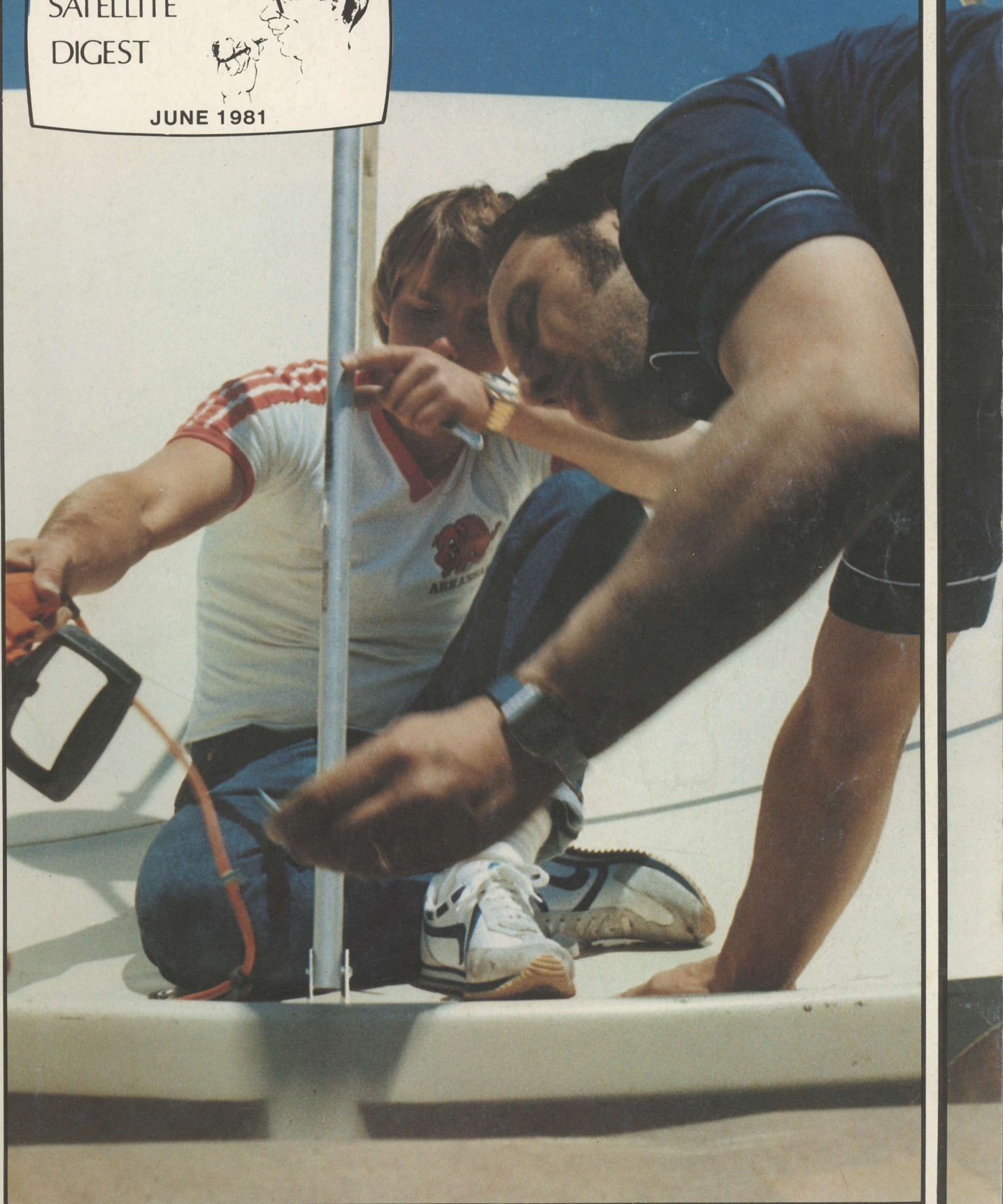


COOP'S  
SATELLITE  
DIGEST



JUNE 1981



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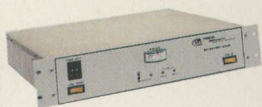


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## COOP'S COMMENT ON TECHNOLOGY

### DEEP SOUTH / RE-VISITED

The April issue of **CSD**, focusing on the various legal and technical break throughs presented by the expansion of US DOMSAT reception to areas of the Caribbean, Central and South America, met with mixed reviews. A sizeable percentage of the readers found the material dull and not relevant to their interests. Others said the comprehensive look at the scenario now being painted south of the border helped them better understand the frictions that underly much of what is happening in North America.

Several dozen people from the southern climes journeyed to Washington's SPTS in April and we had the opportunity to visit with many of these people. We learned a great deal in these visits and were grateful for the opportunity to exchange data.

Reception of US DOMSAT signals, on FI, is tricky at best. One fellow from Jamaica finally ended up installing a ten meter Scientific Atlanta dish (for a hotel there) in order to insure 100% reception 100% of the time. That's a bunch of antenna and no small effort. Six meter antennas, reported in the April **CSD** as being 'adequate' in Jamaica for FI, may not be so adequate after all. That is a qualified 'maybe' since I've not been on site yet to inspect the workmanship or installation techniques. Not all six meter antennas in Jamaica are creating perfect pictures; that much is clear.

Bill Larsen from Caguas, Puerto Rico was in DC at SPTS. He had just finished an 11 meter (!) spherical similar in design to that shown on the front cover of **CSD** for last March. Bill's 11 meter should by now be installed and operating in a Caribbean country where it will be feeding a 2.1 GHz MDS transmitter. The system will be taking down US DOMSAT signals and pumping them back out, scrambled, on MDS to subscribers in a million-plus market. I think it best I not identify where this is being done, for now. Bill and I discovered we both suffer FI "abnormalities" or in the technical jargon

"anomalies". He, like I, sees variations in the +/-1 dB region on FI signals over both short term periods (30 minutes or less) and long term (day to day). Like my Turks and Caicos 5 meter installation, Bill's 8+ meter Spherical in Caguas, Puerto Rico finds 21 lowest in level and 7 highest in level. We both measure bird wanderings far greater than the 70 mile box RCA professes to maintain and we both find the polarization integrity skewing about at irregular times. I mentioned that when the signals are strongest I seem to have the greatest amount of polarization 'shift' and he nodded agreement from his own experiences. This was something I noticed once or twice in Oklahoma but never with the great regularity I chart here in the Caribbean. There is apparently more going on with the bird or the downlink path than we have previously known and understood.

A contingent from Columbia brought along a set of snapshots showing their results with US domestic birds, the Russian Ghorizont and the Brazilian feed on Intelsat. Using 7 and 8 meter home brew dish antennas these fellows are obtaining fantastic results. The Brazilian and Russian signals are better than anything I've ever seen off of any bird. Unfortunately Columbians don't speak Portuguese or Russian (yet). One chap from Columbia invited his local newspaper to use his TV monitor screen while the shuttle was making its maiden flight. The newspaper ran several pages of off-TV-screen photos of the Columbia blast off and landing plus an elaborate story on this individual's installation. For contrast the paper displayed a wire service photo of Columbia landing against the almost same shot taken from the TVRO receiving site screen. The TVRO shot was several times as high in definition plus it was in color!

There is a movement afoot to call a meeting, perhaps in mid to late July in Miami, of all people from the Caribbean, Central or South America interested in forming a 'steering committee' that would eventually become a regional satellite hardware users and sellers organization. Those of us stuck out here in the fringes of decent reception share common legal and technical problems. One way to prepare for the certain legal challenges is to be prepared with an organization that has the resources to meet the challenges. If you live or work in the area outlined, we invite your input and if possible participation. Bob Behar in Miami (Hero Communications, 1783 W 32nd Place, Hialeah, FL 33012; 305-887-3203) is building a 'list' of interested people. I'll be chairing this meeting and look forward to having you there also.

Just in case you might think only the small self starting individuals are interested in the Caribbean market place...at least one firm with marketing plans to serve all of the Caribbean is now offering Scientific Atlanta ten meter packages. These \$100,000 price range terminals are being targeted for hotels and resorts spread throughout the region and an aggressive marketing program is already underway. Caribbean hotel owners meeting in mid month at an annual conclave will be the first to hear of this program. Opportunity, as always, is where you find it.

CSD  
TECHNOLOGY



**COOP'S SATELLITE DIGEST** (Technical Section) is published monthly by West Indies Video, Ltd. a Turks & Caicos Corporation with business offices located at Grace Bay, Providenciales, Turks & Caicos, B.W.I. Mail to CSD, advertising inquiries and subscriptions should be addressed to CSD, P.O. Box G, Arcadia, OK 73007; a mail forwarding point. CSD maintains no office in the United States of America although assistance relative to CSD advertising and subscriptions is available through the offices of Satellite Television Technology at (405)396-2574. STT has no legal affiliation with West Indies Video, Ltd. Subscription rates to CSD are \$50 per year in the US, Canada and Mexico; \$75 elsewhere. Entire contents Copyright 1981 by West Indies Video, Ltd.; Robert B., Susan T., Kevin P., and Tasha A. Cooper.

## WAVEGUIDE CUT-OFF PROBLEMS

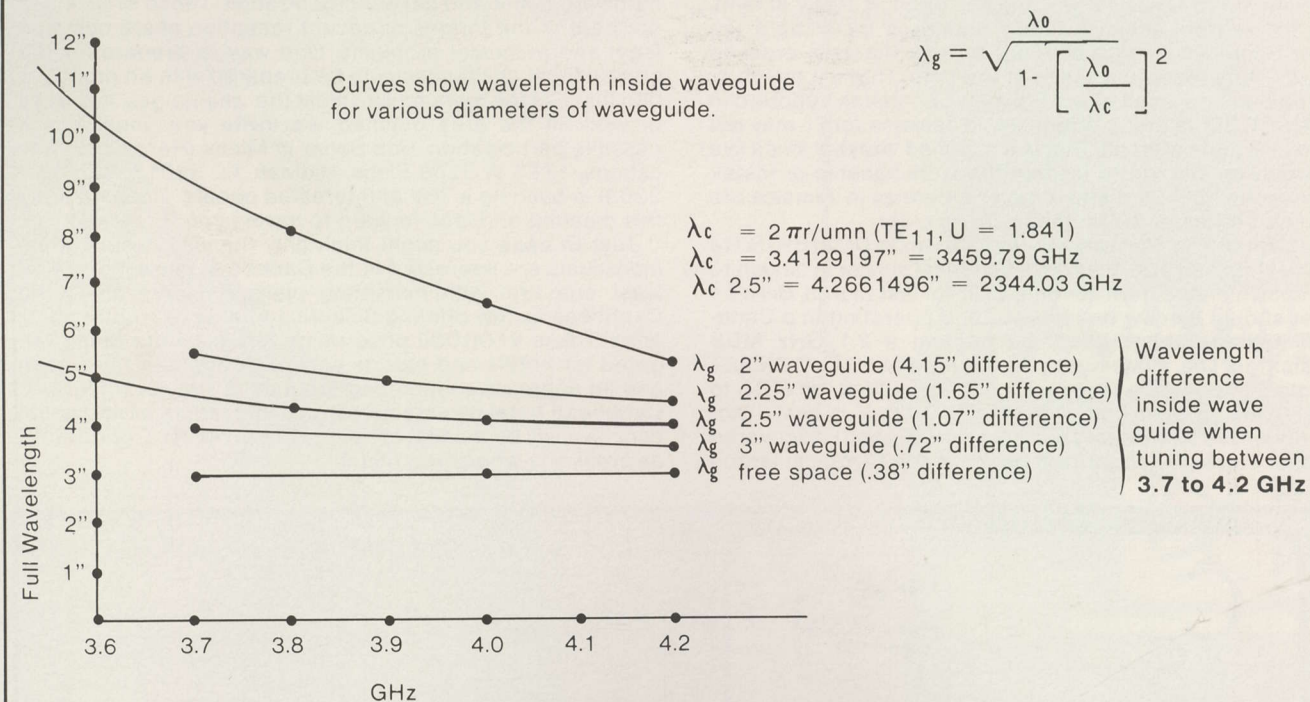
I began using 2" ID copper pipe for my waveguide sections (each of the 'Umbrella Antennas' has a built-in waveguide section to couple the energy from the splash plate reflector at the front focal point to the LNA which mounts to the rear) because Steve Birkill and Robert Coleman said this was the appropriate size to use. Just to be certain this was good 'poop' I checked the cut off frequency which turned out to be 3.64 GHz; obviously safe for 3.7 GHz.

Then I began building up my own LNA stages (see CSD for April 1980) and I had a difficult time broad banding them to operate properly across the full 3.7 to 4.2 GHz band. I kept

working with the LNAs but never could achieve a proper broad banded response and could only get optimized performance by tuning the waveguide with a waveguide 'short'. If the unit worked properly at the high end of the band it fell apart at the low end. If it worked properly at the low end it fell apart at the high end.

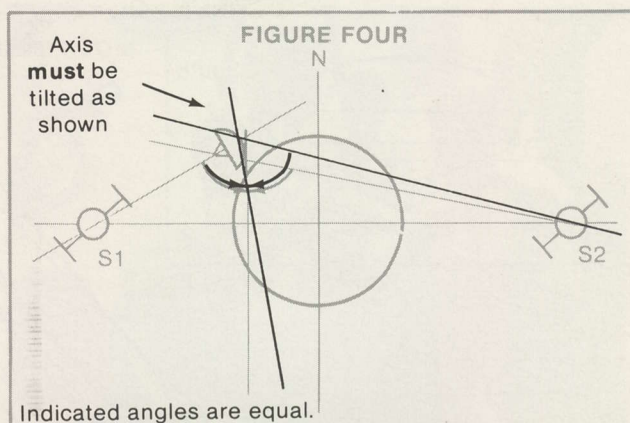
Suspicious of the waveguide I tried a 2.5" ID piece of copper pipe; electing the 2.5 inch size primarily because this was the next 'up' so-called "standard" size which was generally available. The result was that I had flat response on the low end, and usually on the high end as well but I was losing channels (transponders) **randomly** through the middle because of something called 'multi-moding'.

The solution seems to be that you must use a section of waveguide which is just large small enough to keep the section from going into undesired modes such as  $TM_{01}$  or  $TE_{01}$  on the high end of the band but large enough to keep from having too large an effect on the wavelengths inside the waveguide (see graph). If the waveguide is too small you will have a difficult time optimizing the pick up probe situated  $1/4$  wavelength from the end of the tube and one end or the other of the band will suffer. The answer is to select a tubing that is 2.15" minimum to 2.25" maximum (ID). The standard 2" copper pipe can be used of course but you cannot get the full bandwidth without tuning the shorting stub at the end of the waveguide section. If you happen to be located in an area where there is surplus signal to 'burn' you might not notice this problem. If however your system is marginal, your home-brew waveguide may be costing you precious dBs!



by  
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 San Bernadino, CA 92406

**CORRECTIONS  
ALL SEASON  
POLAR MOUNT**



The April issue of **CSD**, starting on page T3, presented a paper by TVRO enthusiast Ronald Waltner of Indianapolis, Indiana stripping away the mysteries of polar mounting systems. Waltner is a perfectionist and we try to be as close to perfection as we can ourselves. Some of the Waltner drawings were slightly 'tangled' in the editorial process and while few would probably have been led astray by those drawing inaccuracies we want to set the record straight.

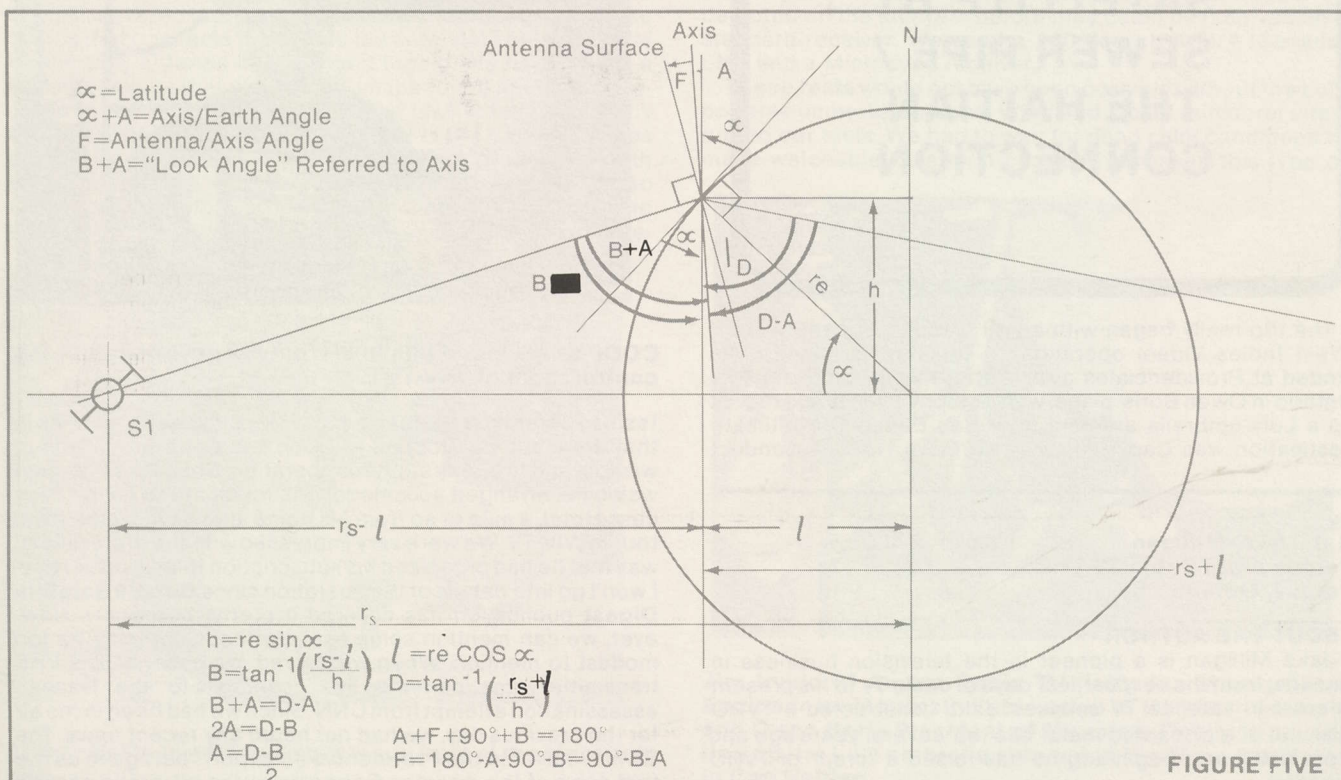
We present those corrections here and suggest that you go back to your April 1981 **CSD** and note these corrected drawings as appearing in this June issue. In **figure four** our artist neglected to show the proper tilt of the axis of the dish antenna. The corrected drawing is shown here.

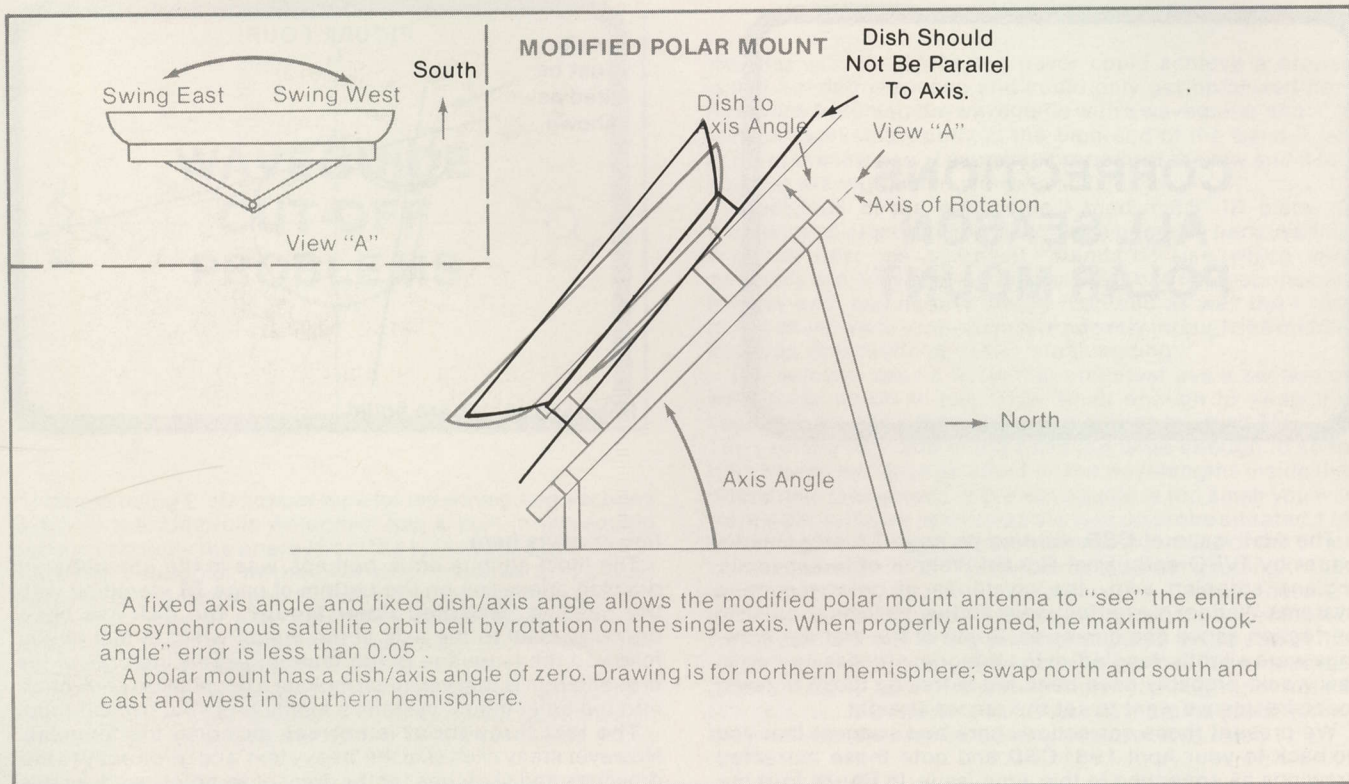
In **figure five** a small error crept into the mathematical formulae for the computation of the look angle. The correc-

tion appears here.

The most serious error, perhaps, was in the unnumbered drawing appearing on the bottom of page T5 identified with the heading '**Modified Polar Mount**'. The dish has been drawn parallel to the axis of the mount while in fact (if you followed the language of the Waltner paper) the crux of his presentation is that you must include a declination correction into the polar mount system; a function of your own latitude.

**The text throughout is correct**, including the formulae. However many of us skip the 'heavy text' and go directly to the drawings and sketches for the meat of an article such as this and in that department we get a grade of 5 on a scale on 10. We apologize to Waltner for the sloppy drafting in this report and hope that readers were not confused by our small but important errors!





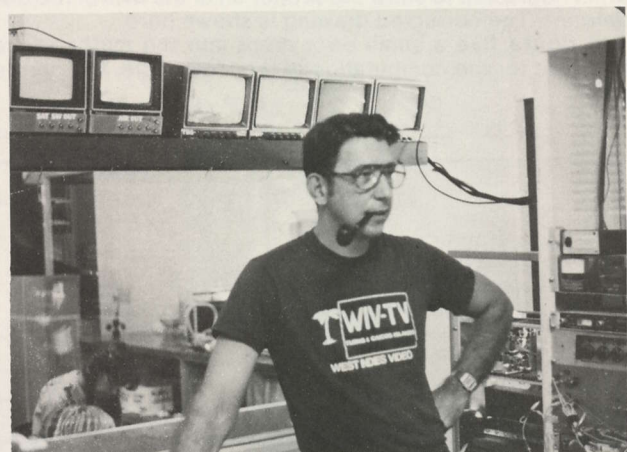
## SATELLITE BY SEWER PIPE / THE HAITIAN CONNECTION

The trip really began with a visit to Bob Cooper's WIV-TV (West Indies Video) operation on the Caicos Islands. We landed at Providenciales airport after flying from Hamilton, Ontario in Owen Boris' plane, with a stopover in Florida to pick up a Luly umbrella antenna from Bob Behar. Our ultimate destination was Cap Haitien in Northern Haiti, to conduct

by  
**G.J. (Jake) Milligan**  
**Fergus-Elora Cable TV Ltd**  
**Fergus, Ontario**

### ABOUT THE AUTHOR -

Jake Milligan is a pioneer in the television business in Canada; from the very earliest days of cable TV to his present interest in satellite TV services. Jake constructed a TVRO dish out of a discarded metal 'silo top' several years ago and from that basic beginning he has raised a "crop" of TVRO systems.



**COOP as we found him in his 'natural environment'; the control room of WIV-TV.**

tests to determine the feasibility of installing earth stations in that area, but we stopped at Coop's to get a few words of wisdom and to briefly study his operation. Coop made us most welcome, arranged accommodations for us at the Island Princess Hotel, a mile or so from his home, and gave us the royal tour of WIV-TV. We were very impressed with the professional way that he had organized his subscription television service. I won't go into details of the operation since **Coop's Satellite Digest** publication has covered it pretty thoroughly. However, we can mention some aspects that Coop may be too modest to mention. When we arrived, his channel four VHF transmitter was carrying live coverage for the Reagan assassination attempt from CNN. Since we had been in the air for the previous day, we had not heard any recent news. The B&W receiver in the Providenciales airport "bar" gave us the first news of the disaster. Coop was giving coverage second



The WIV-TV 'Annex' with 5 meter TVRO antenna (right).

to none - anywhere in the US. Later, when we arrived at his control room, we were impressed with the fine Satcom pictures displayed on an array of monitors. The multiplicity of VTR's, test equipment and satellite receivers demonstrated that Coop was not fooling. When his network is fully operational it will bring an excellent and varied television service to the Turks and Caicos Islands.

**After picking** Coop's brains and garnering what advice we could, we set off to complete our Haiti experiments. We landed at Cap Haitien and were soon busy trying to get our array of technical equipment past the Haitian customs officials. After much delay a phone call from President Duvalier expedited the release of our satellite receiving equipment. Owen's friend and our host in Haiti, being an acquaintance of "Baby Doc", was instrumental in having the President intercede on our behalf.

**When we finally** got the equipment from customs, we proceeded to attempt to set up our Haitian earth station. We soon discovered that we were missing a vital component - the device that connects the LNA to the antenna! The waveguide on the Luly antenna is 2 1/4" round tubing. We had to have a transition piece that would go from the round antenna waveguide to the rectangular input of the LNA. It had apparently been overlooked when the remainder of the equipment was picked up in Miami. Since there was no way to make the earth terminal function without this component, we set out to fabricate a substitute. Finding the necessary material was, to say the least, a very difficult task. Owen finally found a three-



Author Milligan getting a severe sun burn at the Mont Joli site.



The sewer pipe transition being fabricated at the Cap Haitien Technical School; many willing hands to help!

foot length of brass sewer-pipe in a junkyard. This pipe was taken to the Cap Haitien Technical School, where we tried to explain how we wanted the tubing modified for our purposes. Since none of us spoke French, it was difficult to convey our exact requirements. However, after much sign language and trial and error, we finally had our "sewer-pipe" transition from circular to rectangular waveguide.

**This transition** was attached to the Luly antenna and pictures were received. The Westar and Comstar birds produced watchable pictures with some identifiable reception from Anik. No Satcom signals were received.

**The satellites** were found first by using a Hewlett Packard Spectrum Analyser that displayed the entire 3.7 to 4.2 GHz band. As soon as carriers could be clearly displayed we switched to a video monitor to identify the various transponders. This method of initial signal acquisition proved superior to using a TV receiver for that purpose. Signals could be detected on the analyser before they could be resolved on a standard receiver. We used a 100 degree K M/A (Canada) LNA and a Microdyne receiver.

**These tests** would not have been possible without the Luly portable umbrella antenna. Wind and a brief rainstorm interrupted our tests. We had to wait for dead calm conditions to make watchable reception possible. However, this type of



Jim Irvine of Aurora Cable TV (left), Ian Munro Chief Engineer for Mountain Cablevision in Hamilton (center) and Owen Boris President of Mountain Cablevision setting up the Luly umbrella antenna at the Mont Joli Hotel in Cap Haitien.



**Walter Bussenius (center), owner of the Mont Joli Hotel in Cap Haitien and an admitted satellite TV 'junkee' with Owen Boris (right of Walter) on the roof on the Mont Joli with the Luly antenna. What times does Satori come on the air???**

antenna did perform remarkably well in spite of adverse conditions and a "sewer-pipe" transition. One of the viewers commented, when he saw pictures coming from the R-Rated Satori channel, that the sewer-pipe was still conveying excrement. This opinion, however, was not shared by the others eagerly clustered around the test set-up.

## HOW TO CHECK TVRO DISH SURFACE ACCURACY

Ridding your station of those annoying sparklies can sometimes be an almost endless parade of 'little hassles'. Low temp LNA's and super feedhorns help. But when the problem seems to be an out-of-curve dish, it can be down right frustrating. The real trick is knowing if you've got a problem. Not all manufacturer claims can be believed. So what can you do? Trying to eyeball dish accuracy is near impossible!

Here's an easy way to shut down the hidden sparklie generator. Actually, that's a misnomer since the sparklies are anything but hidden! We use a quicky computer program to spit out the raw numbers so we can build an exact template to lay in the dish and check accuracy. It looks like a sort of half-moon. You can build the template from cardboard or maso-

by  
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### ABOUT THE AUTHOR -

Steve Gibson is crazy about satellites. After attending SPTS '79 in Oklahoma he rushed back to Hollywood and immediately began installing his own ten foot terminal. When he later found out that his Hollywood home was unfortunately situated (between the entire Los Angeles terrestrial microwave terminus points) he sold his house and moved to the top of a tall southern California hill / mountaintop. Free of 4 GHz and air smog Gibson now routinely tunes in Moscow and Mexico, Canada and Cairo (Illinois) on his motor driven computer controlled automated dish. Gibson has appeared at several SPTS events, has authored an STT Manual ("**The Gibson Satellite Navigator**") and is currently biting off his finger nails hoping that the FCC grants him his LPTV license so he can turn his mountain top home into the voice of "Television-Free-Satellite".

nite or plywood. Whatever is on hand that is reasonably stiff. Metal is best. But you may want to try the 'Lazy Way' first. More about that later.

All you do is type the program into nearly any hobby computer with BASIC and run it. Even a 'hunt and peck' artist should be able to type this little ditty into a machine in minutes. And if you don't have a computer of your own, use someone elses. You can always promise them a peek at 'TV from space'! The whole process is easy and beats the time you'd spend working out a batch of calculations on a legal tablet (I use a lot of 'em). The program will give you a screen display or a hard copy print-out if you have a printer connected.

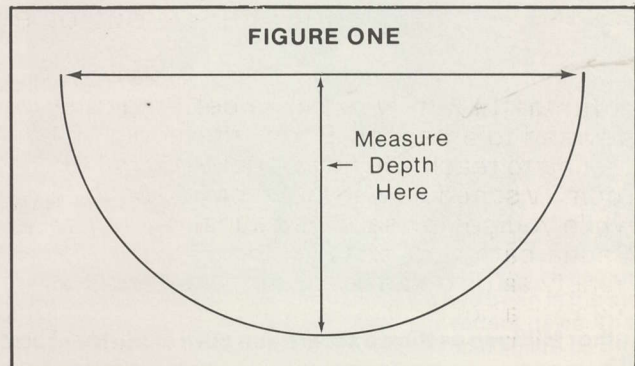
### MAYBE YOU DON'T HAVE A PROBLEM!

Before you run down to your nearest Radio Shack for a computer, perhaps you should take another look at your dish. Is the LNA really at the dish focal point? An easy way to check is given in **Coop's Satellite Operations Manual**. Checking all three adjustments takes very little time and can make a spectacular difference in the picture. The formula for these adjustments is:

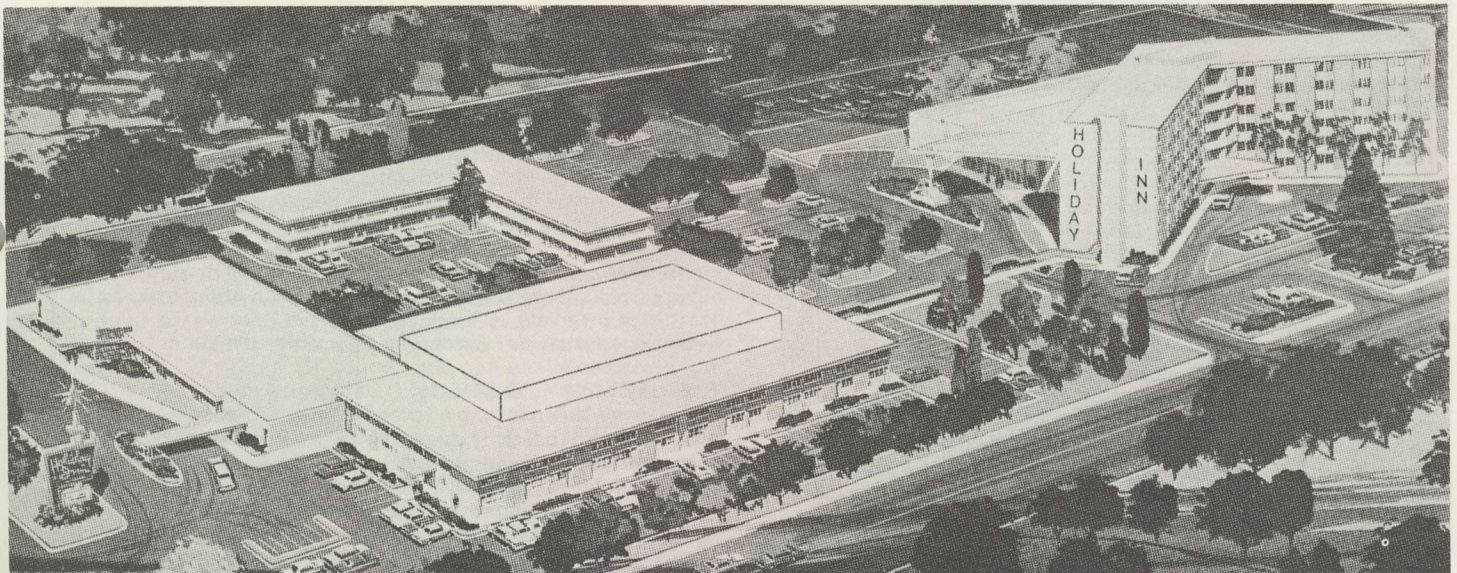
$$\text{DISH FOCAL LENGTH} = \frac{W^2}{16 \times D}$$

Where.... **W** is the width of the dish in inches  
**D** is the depth of the dish in inches

You measure the depth by simply stretching a wire across the dish and measure from the exact center of the dish UP to that wire as seen in **figure 1**. Making this measurement is easier said than done even if the dish is laying on the ground. Running the wire is no problem. But the center measurement can be something else. So I use a yard stick taped to a broom handle to reach into the dish. This way you can measure depth with little or no effort even if the dish is already on a mount.



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OR CALL for full details; SPTS '81 at 405/396-2574.

Next, you plug the numbers into the above formula to find the focal length. You'll need something longer than a yard stick to measure the distance up to the LNA. I use cheap wall molding available at any hardware store and tape it to that same broom handle. If the mouth of your feed horn turns out to be some distance away from the focal point you calculated above, it's time to get out the ladder and adjust it. Taking measuring tape accuracy into account, your feedhorn should be **within an inch or two** of the calculated value.

You may find yourself doing a lot of climbing if you want peak performance. Use the signal meter on the receiver to check for any improvement. If your receiver doesn't have a meter, you can use the simple circuit from the **Gibson Satellite Navigator Manual** or study the picture on any weak transponder and tweak the LNA for the least number of sparklies the way Coop shows you in his OPERATIONS MANUAL. What do you do if you still have a rotten picture?

### SIMPLE DISH MATH

Here is where we let the computer do the work. If you want to get to the bottom line, then skip over this part and start typing in the program. Otherwise, let's rush through the basics.

You know that the f/D ratio describes much of the geometry of your dish. In fact, that's precisely what the program uses to give you the numbers for your template. To find the f/D ratio of your dish, you simply divide the focal length of the dish (calculated above) by the diameter. Easy isn't it?

$$f/D \text{ ratio} = \frac{\text{Focal length}}{\text{Diameter}}$$

Use the first formula to find the focal length. Then use the one above to find the f/D. Don't be surprised if the numbers you get are different than those that the manufacturer gave you. Despite the error, you may still have a 'near perfect' dish. The day of the '**perfect**' dish is still in the future. Metal and fiberglass can be made to conform very well to a mold, but don't expect perfection. Some **clever** dish makers, **adjust their molds** to compensate for possible error.

Now before you reach for the phone to call and raise Hell about the strange numbers, you should double check your work. You must make sure all your numbers are in the same units (inches). The f/D value you get should be something between .3 to .6 or you may have a math error. If you're lost at this point, you can catch up very fast by simply remembering that the number we seek is only a ratio. It isn't a discreet measurement. We use this ratio in other calculations to generate a parabolic curve and the like.

Working backwards, it follows that a knowledge of the f/D ratio of your dish is all that's needed to calculate the focal length. We can easily transpose the equation to read:

$$\text{Focal length} = f/D \text{ times Diameter}$$

But don't do it! If your picture stinks, the original design f/D ratio may be different from your actual dish. It is better to 'plod out there' and measure your SPECIFIC dish. Keep in mind that your actual dish f/D can indeed be different from the specs and still work fine. The key idea here is to see how close to a parabola the dish conforms. Then locate the feed horn at the locus of YOUR PARTICULAR PARABOLA!

### PROGRAM BACKGROUND

The program simply plugs your dish f/D ratio into the formula for a parabolic curve similar to one in the **Nelson Parabolic Dish Manual** and calculates the depth at intervals you select. As a by product for those of you building a mold, the program also calculates the 'behind height' of a parabolic dish. This calculation does not take into consideration thickness of the final dish or the amount of warping likely to occur as a result of fiberglass curing.

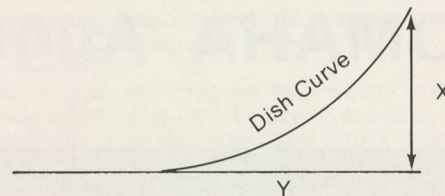
The formula used in the program is:

$$X = \frac{Y^2}{4D (f/D)}$$

**Where:** X = height the curve rises above a base line  
Y = distance from the center  
D = diameter of the dish  
f/D = ratio of focal length to diameter

You may see it better in **figure 2**.

FIGURE TWO



Perhaps the best part of this program (listing in **figure 3**) is the opportunity for you to choose the accuracy of the measurements. That isn't quite true because the accuracy is as good as your computer. What we mean here is the 'interval' between calculations. You can pick wide intervals like 5 inches (sample run in **figure 4**) for a spot check or grind out a mile of paper at mere fractions of an inch. Anything less than 1/16 inch intervals is madness and will only waste paper, wear out your printer and boost your electric bill!

### THE LAZY WAY TO CHECK

If the idea of transferring all those little numbers to a piece of wood or metal that will have to be cut, bothers you, then why not do a few calculations by hand and use the yard stick method described above?

All that you need formula wise is here. Just find a broom, a yard stick and a long reel-type measuring tape to stretch across the dish instead of a wire. Try 5 inch intervals. That way you'll have only a dozen or so calculations to make. A cheapy calculator will save time. And if you are truly lazy, you'll opt for the computer anyway.

### WHEN IT DOESN'T WORK!

The outcome of your effort can go about 4 ways.

1) You did the preliminary math and discovered the feed horn was in the wrong place. You didn't bother with the program or the template because the picture is fine now. The simple meter circuit described in the **Gibson Satellite Navigator Manual** made all the little adjustments very easy for you to do.

2) You ran the program and everything checks. Your only concern is what to do now with that big template you made!

3) The f/D was different from manufacturer specs, but you ran the program using instead the f/D you calculated. You then cut a template and it fit the dish like a glove!

4) The f/D was either different or right on. You kept re-running the program until you got the right numbers, but the template you made shows big (as in fractions of an inch) gaps when layed in the dish.

This is where you must sit back and 'survey the scene' as a teacher of mine once told me. Try to first see if you've made a mistake. Check the original measurements. Then re-run the program and see that the program gets the same focal length and depth as you did before it merrily went about banging out

```

10 '
20 ' STEVE GIBSON'S DISH DESIGNER/CHECKER
30 CLEAR 100 :P$="*****" (C)1980 SC GIBSON
40 '
50 CLS : 'CLEARS THE SCREEN ON MY MACHINE
60 PRINT : PRINT "THIS IS GIBSON'S DISH DESIGNER/CHECKER"
70 PRINT
80 INPUT "INPUT F/D RATIO " : F
90 INPUT "INPUT DISH DIAMETER IN FEET " : D
100 D = D * 12 : 'CONVERT TO INCHES
110 PRINT "THE FOCAL LENGTH IS " : FWD : " INCHES."
120 R = INT(D/2) : 'GET RADIUS
130 B = 4 * D * F : D1 = R * R/B : 'FIGURE DEPTH
140 PRINT "THE MAXIMUM DEPTH OF THE DISH WILL BE " : D1 : " INCHES."
150 PRINT "AT WHAT INTERVALS DO YOU WANT MEASUREMENTS?"
160 INPUT ".25 INCH, 5 INCH, ETC " : M
170 INPUT "WANT HARD COPY PRINT-OUT Y/N " : Q$
180 IF Q$="Y" THEN 350
190 CLS : 'CLEARS SCREEN
200 PRINT "PRESS ENTER TO DO EACH CALCULATION"
210 PRINT
220 PRINT "MEASURING FROM THE CENTER OUTWARD..."
230 PRINT "DISTANCE", "BEHIND HEIGHT", "FRONT DEPTH"
240 PRINT
250 FOR I = 0 TO R STEP M
260 PRINT USING P$; I;
270 PRINT TAB(14);
280 PRINT USING P$; I * I/B;
290 PRINT TAB(30);
300 PRINT USING P$; D1 - (I*I/B);
310 LINEINPUT Q$
320 IF I/3 = INT(I/3) THEN PRINT "DISTANCE", "BEHIND", "FRONT"
330 NEXT I
340 END
350 ' PRINTER SUBROUTINE
360 LPRINTSTRING$(62,"*") : LPRINT " " : LPRINT " "
370 LPRINT CHR$(14) "GIBSON'S DISH DESIGNER/CHECKER"
380 LPRINT " " : LPRINT " "
390 LPRINT "DISH DIAMETER = "D/12;" FEET (" : D : " INCHES)"
400 LPRINT "F/D RATIO = " : F
410 LPRINT "FOCAL LENGTH = " : FWD : " INCHES"
420 LPRINT "MAXIMUM DEPTH IS "D1;" INCHES"
430 LPRINT " "
440 LPRINTSTRING$(62,"*") : LPRINT " " : LPRINT " "
450 LPRINT "MEASURING FROM THE CENTER OUTWARD AT " : M : " INCH INTERVALS..."
460 LPRINT
470 LPRINT "DISTANCE" : TAB(27); "BEHIND HEIGHT" : TAB(48); "FRONT DEPTH"
480 LPRINT " "
490 FOR I = 0 TO R STEP M
500 LPRINT USING P$; I;
510 LPRINT TAB(29);
520 LPRINT USING P$; I*I/B;
530 LPRINT TAB(49);
540 LPRINT USING P$; D1 - (I*I/B);
550 NEXT

```

a list of measurements. The way to do this is to keep trying different f/D values. Of course, you can easily calculate the f/D using the above formulas. Or you can spend 20 minutes to rewrite the program to do this for you. But the for sake of simplicity, I didn't bother with it because it may take you less than a minute to find the exact f/D to fit!

Then what? What about remeasuring your template? If it all checks out, but you still see daylight between your template and the dish, then it's time to continue to survey the scene. Is the crack between the dish and the template gradual? If so, you've cut a template for a dish f/D **other than yours**. Go back and measure and cut a new curve.

Now a crack here and there means something is definitely wrong! At this point, your only option is to either see about a new dish or find a way to resurface it or bend it into shape if it's metal. This can be very frustrating because bending the dish may not be practical.

Still, it may be possible to bend a fiberglass dish. How's that? Few dishes are made in one piece. You're lucky if you have a 'bolt together' model. First you dismantle the dish. Then reassemble it on the ground but in a way that compensates for the small error. Ream out a bolt hole or two. Bend, twist and sweat. Use the template guide. It doesn't always work. But it's worth the effort when you consider the alternatives. A close working relationship with the manufacturer can shift a lot of worry off your shoulders.

Suppose you **still** have bad pictures. Component substitution is just about all that's left when you've made all the possible adjustments...except for one thing. **Location!** You may have one of the most elusive sparkie generators. Yes indeed. The bane of all TVRO pioneers...interference. Remember, other services share the same frequencies with TV satellites. If you find sparklies on a few or even half of all the transponders, then the PLL in your receiver may be working overtime jumping back and forth between the terrestrial signal and the satellite. Now before you junk that nifty

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 F/D RATIO = .42  
 FOCAL LENGTH = 75.6 INCHES  
 MAXIMUM DEPTH IS 26.7857 INCHES

\*\*\*\*\*  
MEASURING FROM THE CENTER OUTWARD AT 5 INCH INTERVALS...

DISTANCE	BEHIND HEIGHT	FRONT DEPTH
0.000	0.000	26.786
5.000	0.083	26.703
10.000	0.331	26.455
15.000	0.744	26.042
20.000	1.323	25.463
25.000	2.067	24.719
30.000	2.976	23.810
35.000	4.051	22.735
40.000	5.291	21.495
45.000	6.696	20.089
50.000	8.267	18.519
55.000	10.003	16.782
60.000	11.905	14.881
65.000	13.972	12.814
70.000	16.204	10.582
75.000	18.601	8.185
80.000	21.164	5.622
85.000	23.892	2.894
90.000	26.786	0.000

Howard PLL board, I should say that there may be another way. The secret is to simply make the terrestrial signal **weaker** than the satellite signal. We'll cover interference in another installment. In the meantime, start looking for a broom and a yard stick!

## JOHN ROHNER GENIUS OR ???

For some months **CSD** has been receiving letters from readers who have experienced "problems" with John Rohner. For the unwashed, Mr. Rohner is a man in West Liberty, Iowa who began advertising in the March 1980 issue of **CSD**. He offered the industry a set of circuit boards which he said would make construction of the Taylor Howard receiver or Robert Coleman projects 'easier'. He continued to advertise those circuit boards through the spring and early summer of 1980. Then along in the June issue or so John Rohner announced to the world a very innovative new receiver; it would have an LNA plus downconverter together at the feed of the antenna, and inside the house a very special 'digital demodulator'. Rohner promised to show this new LNA plus receiver, which he priced at just \$1500, at the San Jose SPTS show.

We first met John Rohner at San Jose. He seemed like a personable enough chap; a bit rough cut perhaps but sincere

in his utterances and not afraid to look you in the eye when he told you something. Prior to SPTS San Jose, Rohner had asked or rather volunteered to be on the San Jose program; not once but twice. He volunteered an engineering friend from 'Southern California' to help him describe his innovative \$1500 LNA plus downconverter package to the crowd and then also was scheduled to describe his design work with LNAs. We had our first real problem with Rohner at San Jose; the time came for he and his engineer friend to appear on the program and...nobody showed up. After starting the session (without Rohner or friend) we asked everyone to be patient while we tried to run down John. The worst thing that occurred to us was that John Rohner had simply forgotten the time. We located him in his booth, holding 'court' for several attendees.

"You are 'on' now John" we exclaimed. "On what?" he retorted. "On the program - this is your time to present your program". His response should have told us much more than it did at the time.

"Oh that...well, my friend didn't show up so I decided not to do it." We mentioned that several hundred people were sitting in an auditorium waiting for him. He shrugged his shoulders. We ran back through the poolside area to the auditorium to report that John Rohner and friend would not be there. We had egg on our face and clearly did not like the feeling. Something like that had never happened to us before.

Meanwhile in his booth, Rohner was busy showing people how his computer could spit out geostationary arc information. He was also 'explaining' to those who asked why he did not have his fancy LNA plus receiver in his booth. What he did have was a box he called the 'RCVR'. He would later change the name on this box to the 'Basic RCVR'. We'll see why.

Now let's back up a bit and return to the spring of 1980. John Rohner, a bright young man with family roots and ties in Iowa was into the satellite hardware business. John's father had started a rather substantial business in West Liberty when John (the oldest of four children; three brothers and a sister) was a wee lad. The family business is called Rohner Machine Works. Today the elder Rohner is retired and living in Florida. John's younger brother Bob took over the operation of the family machine works when the father retired and according to sister Liz, the machine works turns out bearings and machined parts for such customers as International Harvester. Liz believes it may employ as many as 200 people at times. John's interests were never developed in the machine works area; his interest was electronics. Another brother, Tom, also had an interest in electronics. Today, brother Tom builds computer equipment in the same family manufacturing center and Liz suggests Tom employs perhaps 25 people or so.

When John Rohner took out his first advertisement in **CSD**, advertising Howard and Coleman circuit boards, the name of the company to which orders would be sent was:

### ROHNER MACHINES WORKS, INC.

That was a mistake on John's part, we later learn; a mistake he made because he had failed to 'clear' use of the family business name **with his father**. Eventually the Senior Rohner discovered that his eldest son was using the name for his circuit board business.

Sister Elizabeth, "My father was outraged when he learned about this. He demanded that John stop using the name immediately."

'Immediately' was in Rohner's last circuit board advertisement with **CSD**; it appeared in the August 1980 issue but again we are getting ahead of our report.

According to Elizabeth, John's past has included time spent in Hawaii and California. "I didn't know much about what John was doing in those years" Liz recalls "but I know that our father was bailing him out of one problem after another". Elizabeth also recalls that John was never very grateful for the assistance he got from the family in those past events. "He doesn't remember much about it when you try to talk with him".

Now Elizabeth Reese has reason to know more about what transpired with John's satellite business than most. She was supposed to be a Vice President of a corporation which the family attorney, R. M. Russo, was to form for John's activities.

**"Our family hoped that through John's apparent understanding of satellite equipment, and the willingness of my husband and myself to go to work for the business, that a new enterprise could be arranged".** Using the services of Counselor Russo, Liz tells us, a corporation was drawn up and John was left with the task of getting the corporation papers filed with the State of Iowa. Liz's husband left his union painting job and the two of them went to work for John. Well, sort of. "John told us, after the attorney left, that we wouldn't **really** be working for the company; that we would be like **'consultants'**. Each of us would be responsible for our own taxes and workman's comp and so on". Then, at some point John, **Liz claims**, arranged to have the tidy sums her husband had built up in pre-paid workman's comp and other collection areas moved from the accounts of the former employer to John and Liz and the family's new company. Just exactly what really happened here is unclear and it is in fact the subject of litigation. Elizabeth Reese and husband have been in court hearings approximately six times since the first of 1981 on this matter trying to get the funds back to where they belong. The family business attorney, R. M. Russo no longer represents John Rohner's business; we'll see why Liz says this is so shortly. In taking her brother John to court Elizabeth Reese is using Jay N. Russo, the son of the elder attorney the family has used in the past.

Elizabeth Reese wants it plainly understood that she does not have her brother in court because of a grudge match. **"It all started when my husband and I got tired of hassling with customers and would be customers over non-existent money".** Elizabeth remembers the circuit board business very well; when she started working for the company, or rather herself as a part of the company, late in the spring of 1980, her first task was to get orders filled for the circuit boards **John had been advertising since March.**

"To help John get started, brother Tom had extended to John the use of a portion of his section of the computer plant; and he had given John **permission** to use **his established credit** with various suppliers to buy parts. When I was given the job of filling orders in May, I found many of the parts had never even been ordered". At the same time Liz was trying to fill the early orders for IF and demod kits and other Rohner conceived 'Howard' and 'Coleman' circuit boards, John was up to his eyeballs in developing his famous \$1500 LNA plus receiver. We recall John Rohner telling us on the telephone as close as five days prior to San Jose that he would have **no fewer than three** of his 'digital receiver' units on hand in San Jose. Liz recalls the same time as well.

**"We worked right up past midnight on getting one unit to work the very day John had to fly to California. When I went to bed at midnight the first receiver did not yet work. John never told me if he got it working".** We can tell Liz that; in California John Rohner was **not** demonstrating a working receiver. What he did bring with him was **not** the famous digital unit at all but rather the later-to-be-named \$695 "Basic Receiver". In California John Rohner told us that some important transistors had not come in on time so he could not bring the full **digital** package with him. His substitute 'Basic RCVR' was characterized as 'the important elements from the digital package'. Again Liz recalls the matter a little differently than John.

**"The computer radio really worried me. I saw an advertisement for it (in the August issue of CSD) and I asked John how he could advertise something that he didn't have!".** Didn't have? Does Liz mean that John didn't have any radios to ship?

"To the best of my knowledge there never was such a thing as a working Rohner Converting Video Receiver; the 'computer receiver'."

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Some people thought there was. John Rohner told people there was such a receiver. People such as Hayden McCullough believed John when he said there was. At least a few people thought John was being straight with them and sent John \$1500 for a unit.

Charles A. Torbit III (of 3745 S. Temperance, Fresno, CA 93725; (209)266-2088) believed John when he was told on the telephone, in September, that such a receiver existed. Torbit sent Rohner & Associates \$1500 of his money for the LNA plus 'computer' receiver. **"Rohner told me on the telephone that if I wanted one, the price was going up to \$2500 on October 1st. I asked him how I could get one at the \$1500 price"** recalls Torbit. **"He said send him \$1500 right now. I did"**.

For weeks Torbit heard nothing. "When I finally got through, he said that delivery would be 120 days away. I said that didn't seem fair to me and he countered by offering me **'an interim package'** consisting of a BASIC RCVR plus an LNA. At that time the price for the two pieces came to about \$1400 in the marketplace and Rohner assured me that he'd replace them with the fancy model as soon as it was available".

Torbit waited some more. Sister Elizabeth remembers the early fall of 1980 rather well. **"John kept telling me that it was 'normal' in the electronics business to have to wait six months or more for delivery of a new product. I was very nervous about it all anyhow. That was our first real problem; people kept calling or dropping by to pick up their equipment. John kept blaming his answering machine for losing messages when people would drive hundreds of miles to pick up a piece of equipment; which never was ready for them when they showed up. I kept telling John that months, sometimes six months, was too long to keep using people's money"**.

Elizabeth has a vivid recollection of something John told her in their first days of working together. "John told me one

day, as I was trying to make sense of the orders and the letters and telephone calls from people who were anxious to get their boards...

**'Out of every three people who complain about slow delivery, one will be a SUPER complainer and you will have to give him his money back. The other two you can handle and you can continue to use their money for as long as you like'."**

Torbit was not one of those two. Eventually, he received a parcel from Rohner & Associates. Inside was a BASIC RCVR. The top was badly marred, the sheet metal that formed the housing was warped. He took off the cover expecting the worst. Circuit boards were held in place with tape and shields were taped in place. The power transformer was dangling by wires. The box had come essentially undamaged, leading Torbit to believe the unit left the 'factory' in that manner.

**"I took the receiver to a local Fresno firm that specializes in microwave test work. They ran it through the paces and handed it back to me with a cryptic comment. 'That is a piece of junk and it can never work properly; send it back'."** Torbit did just that by UPS. More weeks went by.

Torbit called and finally got through to Rohner. **"I demanded a refund. Not only did the receiver not check out but the other half of the package, the LNA, was not included in the shipment. I only got half of what was promised to me and that half did not work."**

More weeks. No refund. Torbit sent a certified letter to Rohner and kept up the pressure on the telephone answering machine. Over the course of several months, when Torbit did get through the answering machine, he was told four separate times that he had been sent a refund check. Apparently Rohner figured in spite of his persistence Torbit was really one of the 2 out of 3 and not the 1 out of 3. Finally, Torbit did get a check.

**"The check, drawn on the Hills Bank and Trust of Hills, Iowa was for \$1145. Recall I sent him \$1500. At this**

**point I figured the best thing I could do would be to get the check paid through the bank and then pursue Rohner in small claims court for the balance. I had a friend in Iowa who agreed to handle the small claims action for the balance of \$355"**

How did Rohner justify the refund of \$1145 when Torbit sent him \$1500?

"This is almost unreal...even when you are dealing with Rohner" notes Torbit. "Follow the notation on the check stub:

1) Payment - \$1500

2) Less -

a) Restocking fee for LNA - \$155

b) Repair and restocking on RCVR - \$200

3) Total - \$1145.00

**Can you believe John Rohner subtracting \$155 to re-stock an LNA that he never sent me??? Or, charging me \$200 to repair and re-stock a receiver which arrived held together by tape and spit and chewing gum???"**

Then the final Rohner touch.

Torbit. **"The check bounced.** The bank sent it back to my bank. So I instructed my bank to send it back through again. I crossed my fingers. Yup, it came back a second time. **This time marked 'Account Closed'."**

Torbit, a businessman in Fresno, figured he had seen enough. He went to the State Attorney General in Iowa. There he found an investigator who by now was building a file on Mr. Rohner. Onita Mohr (Consumer Protection, Hoover Building, Des Moines, Iowa 50319; (515)281-5926) has "at least six active items in the Rohner file" as of mid-May. She has just finished drawing up a Criminal Complaint against John Rohner and will forward it to Torbit to sign and activate. In Iowa, the Consumer Protection Agency cannot bring suit itself. But it can arrange them on behalf of disgruntled consumers.

Torbit also went to the Mail Fraud folks at the post office. **"They told me I had to fill out a complaint form, which I did. It is now in the hands of the St. Paul regional**

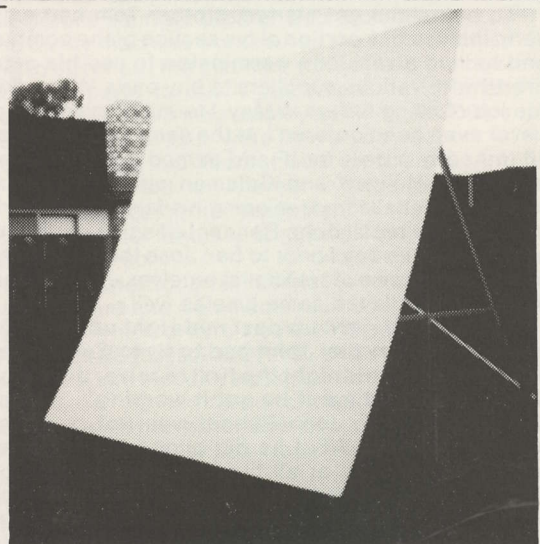
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Santa Cruz, CA 95063

(408) 475-1583

office...but I suspect they work very slowly."

Torbit wants to serve as a collection agent for anyone and everyone who has had their difficulties with John Rohner. John Rohner's sister Elizabeth (\*) wants to do the same thing. Elizabeth again. **"I would like to find just one person who ever received one of the computer receivers. I would like to think somebody got one and that it worked."**

In a R.C.V.R. NEWSLETTER published by John Rohner late in April, the man himself writes about the famed but perhaps ill fated 'digital receiver'.

**"The digital (receiver) is dead, simply too complex for most people to operate..."**

Elizabeth Reese, Charles Torbit and many others would like to see a 'list' of those people who found the digital receiver 'too complex to operate'. We'd settle for a list of people who even ever **saw** one!

John Rohner, not satisfied to take advantage of the two out of three people whom he characterizes as 'being able to handle' so he can 'use their money indefinitely' recently branched out. He and "Vince or George" (no last names!) in Papillion, Nebraska have formed the 'Satellite Television Industry Association'. They had a meeting of the 'STIA' in Kansas City, Missouri in mid-April. Rohner calls STIA **"A trade association for manufacturers, dealers and distributors of earth stations and related equipment."** The 'dues' are \$25 per year. No word on whether this is a non-profit group or where the bank account may be located. Bank accounts and secrecy was another one of Elizabeth Reese's problems with her brother John.

**"The family really hoped that with me, my husband and John involved directly in this, that it would work"**. Unsaid perhaps was Liz's recall of past events where John had to come to the family to get bailed out. By engaging the trusted family attorney to set up the satellite operating corporation, the family felt that John would be forced to follow normal good business practices. **"Then the attorney found out that John had followed none of his advice and he quit. He just washed his hands of the association."** John had been requested to hire an outside accountant to set up a budget and books. John did not. **"We couldn't get an accounting of anything"** notes Liz **"and I don't even know if John ever filed the incorporation papers. Here I was listed as Vice President and I couldn't even find out who we had orders from!"**

At one point last fall, perhaps late September, the family sensed a crisis coming on. "My two brothers, Tom and Bob, decided to offer to help John out of the spot. Tom said he would give John an area in his computer place to work out of, and even do some of the production on the boards for him. But they also wanted John to turn the financial and problem areas over to them to straighten out. John balked."

Bob Luly remembers talking with John at about this point in time. **"He kept telling me that he was having problems getting a particular aluminum casting piece for his digital receiver outdoor unit"** Bob remembers. **"I finally offered to fly somebody back to Iowa from a local foundry to get it straightened out. Then he changed his story and invented a new problem."** Elizabeth recalls John's avowed feelings about his brother's offer of assistance:

"He felt as though the boys were trying to steal something from him. John felt he 'won' that battle because he got use of some of their facilities without having to let them participate in the business end." She characterizes the period as one of "loose liason".

The metal work for the housings and some of the boards apparently did come out of the family facilities for awhile. But most of the work was being done at John's house and garage which had been converted into a workshop. Hayden McCullough remembers visiting John in about June at a time when John was **telling** everyone on the telephone how big

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his operation was and how good his new 'digital' receiver was working.

**"I wanted to handle those receivers; especially at that (\$1500) price"** Hayden recalls. **"So I took him up an 8-Ball antenna and we set it up in his yard at his old house. I honestly think that was the first time he ever saw satellite TV in West Liberty"**.

John talks a good line and has a captivating personality. He has kept many people at 'bay' for months and months after they sent him money. Terry Turner of Houston, Texas waited until John showed up at the Houston SBOC to really pin him down. After trying in vain to get satisfaction for \$4,000 he had sent to Rohner last summer, Turner enlisted our aid at the SBOC '80 show to corner Rohner. Eventually Turner did get his \$4,000 back. He may have been one of the lucky ones.

One person he 'sweet talked' is hard on his case at the moment. Onita Mohr, the investigator for the Iowa Consumer Protection group, at Torbit's request sent a subpoena to Rohner requesting that he **come to Des Moines** to answer questions. Rohner talked his way out of going **in person** and was asked to answer the same questions in writing. He did so under considerable pressure and Mohr then relayed the answers as they related to Torbit to California. Torbit then provided Mohr with tape recordings he had made of each of his telephone conversations with Rohner. The Rohner supplied answers and the tape recordings did not jive according to Torbit. And that 'sworn statement' plus his alleged deliberate attempt to defraud Torbit by closing out a bank account against which he had drawn a check for \$1145 to Torbit is the basis for the "Criminal Charges" under preparation.

Bob Luly, who saw John Rohner in Kansas City in mid-April had an observation of John's attitude these days. "He looked like a man who was on the very brink of falling over the edge; I felt the slightest sustained nudge would push him over."

### Synopsis

Since this industry got underway some 22 months ago, there has been plenty of bad product around. Some, like the Cascade Microwave gear we exposed last fall in **CSD**, was **deliberate** fraud. Nobody is accusing John Rohner of fraud as best we can tell. He may well be guilty of none of what it seems he may have done and it could well turn out that all of the events we have reported are coincidences or perhaps even mis-statements of fact by those reporting to us. In Houston, we asked John to share with us his problems and we asked how he intended to resolve those complaints we knew of. He assured us there were no more than a dozen people who had ever ordered **any** of his equipment and that few of those had experienced delivery or operational problems. We gave John Rohner the benefit of the doubt at that point, especially with people such as Terry Turner later reporting to us that Rohner had returned the money.

\*Elizabeth Reese, Rural Route #3, Iowa City, Iowa 52240.

Perhaps, as sister Elizabeth notes, "John is a very bright, talented person...but he is no businessman". That's no crime, of course. And whether there has been a crime here we shall all have to wait to determine as the cases brought by Sister Elizabeth Reese and unhappy customers such as Charles Torbit wind their way through the courts.

## TECHNICAL CORRESPONDENCE AND NOTES

### FOIL PATTERN REVERSED

The foil pattern appearing on page T4 for October 1980, for Norman Gillaspie's was reversed. A builder looking at the component layout on page T5 would probably figure this out. If you don't reverse the layout (i.e. the left hand side of the foil pattern is actually the output and the right hand side is actually the input) the NEC amplifier will oscillate. I know; mine did.

R. H. Eaton  
26132 Barkstone Drive  
Rancho Palos Verdes, CA  
90274

**Glad you caught this flip-flop error. Hopefully others planning to build this unit will catch this correction!**

### ANOTHER MAGAZINE?

You have done a fine job of getting TVRO moving and as you say it must now move in volume to get places. Coop's articles in other magazines such as **Popular Science** have no doubt alerted the 'masses' to the technology and since you have to reach these people to get the industry moving this has all been well and good.

However to sell the 'masses' you must talk 'to him', not over him or down to him. **CSD** I believe talks way over the head of the average person trying to develop an interest and a foundation in this field. The average person doesn't follow ultra-high technology or the high level politics of the TVRO system. He probably can't afford to attend seminars. What he wants is just enough information, written for his level of understanding, to bolt together the parts to make his own terminal play.

This type of person needs nuts and bolts articles, equipment test reports, problem solving and do it yourself info. In other words he needs the 'nitty-gritty' to get him started. He is hooked on what the system does...but alas, he is now without sufficient information at his level to proceed to the next step. I believe there is a market for a publication that is distributed coast to coast on the newsstands; one that deals with catching and educating the average person into the excitement and reality of having a private terminal.

Without reaching the average person, the masses, I believe the saturation point will soon be reached as the number of engineers, technicians and so on within the 'inner circle' all

have their own terminals. Thanks for listening.

Art LeMay  
Box 1252  
Hope, British Columbia

**This letter arrived after the May issue went to press but before LeMay could have received it. In the May issue we followed similar reasoning to about the same conclusion. What do other readers think?**

### RE-PUBLISH IN INDIA

We have read about the article "Russia's US Viewable Birds" that appeared in the February 1980 issue of **CSD**. We wish to publish a special issue of our journal devoted to receiving satellite TV signals. The bulk of the issue will consist of reprints of articles from other publications. Our monthly journal is distributed to electronic engineers, technicians and businesses spread throughout India and our portion of the world.

M. V. Chauhan  
RADIO  
3, Thiru-Vi-Ka-Road  
Mont Road  
P. O. Box 725  
Madras, India

**Anyone with material they would like to submit to Mr. Chauhan for publication in the Indian Journal RADIO is urged to send it along directly. Be sure to have your post office check the weight of the parcel; mailing to India is not cheap!**

### NOT AMERICAN

I was very surprised to read in **CSD** on page T9 for April where you mention our efforts to obtain results with satellite reception here in Maracaibo, Venezuela. Let me clarify your report by noting that the groups that have worked on this project are all **Venezuelan** and that we work with **Venezuelan** Oil Company. We would appreciate your correcting the comment that said the group was made up of **American** engineers working for an **American** oil company. We have had very good results with antennas as small as 3 meters in size (using the Puerto Rican boresight transponders on COM-STAR) and would be willing to share our information with others. Our telephone number is 061-911333 for those who wish to call before coming by!

Enrique Torres  
Apartado #234  
Maracaibo-Venezuela  
S. A.

**We apologize. There are several groups with TVRO experience now in Venezuela and we got them mixed up in reporting on same in our April issue. Worse than that, we had a history-lapse and had forgotten that all US oil firms in Venezuela were nationalized some years ago; that in fact there are no "American Oil Companies" in Venezuela anymore. Two slaps with a choke chain for our ignorance!**

### WASHINGTON FEEDBACK

I really enjoyed being at SPTS '81 DC and to see how rapidly the industry has grown. The whole affair was quite an eye-opener with the seemingly endless variety of equipment that is now available. However, when you take a hard look at what is available there really isn't anything that is that much different from say a year ago with the exception of the DEXCEL receiver system. Most of the receivers, in my opinion, have only different front panels with much the same class of electronics inside. I fear that the present almost infinite number of manufacturers will be back to repairing TV and radio sets before too long and there will be a stabilizing

period when the serious manufacturers of product with the serious dealers and distributors settle down for the long pull ahead. The next big growth is going to be in the area of dedicated firms who recognize this is not a quick buck business, but a serious one that requires dedication and a willingness to give service at every level. This will start to change this year I believe as those of us who are serious determine that time spent fighting off the 'low ball pricing' of some of the product now on the market is a waste of energy for us.

Rod Wheeler  
NORSAT SYSTEMS  
Box 232  
Surrey, BC V3T 4W8  
Canada

**Rod has been down every road there is to follow in this business; he was the first Canadian person to have a private terminal (see CSD for June 1980) and he was the very first to manufacture a home or private style terminal. His two NORSAT receivers shown in Washington had excellent pictures under trying conditions and the quality of workmanship is impressive.**

I have just returned from the DC show and I won't rake you over the coals. But, I do believe an effort should be made to separate the hobbist and commercial entrepreneurs. I was one of those people in DC who suggested that at the next SPTS you stage a "Shoot Out" at the Nebraska Corral for antennas. Things have evolved pretty rapidly since you and a small group of people began pointing your antennas into empty sky and started receiving pretty good TV reception. The electronic portions of the 'magic system' were and still are a pretty exact science. But it appears the antenna part is more of an 'art' than a science. Some of the commercial people who have been struggling for a long time are doing it pretty well. But many of the rest of us need to know exactly what works and what does not; and why. My suggestion is that we have a test of skills; start off with dis-assembled antennas and then time how long it takes for either two or four man teams to put the antennas together and find FI (for example). Then supply an LNA to the antenna crew and give them maybe 15 minutes to adjust it to their satisfaction. Finally, the time having run out, bring in the measurement equipment and calibrate the quality of their workmanship. If you set up an impartial panel of people to judge the antenna's ease of assembly and you had real power meter numbers for antenna performance, you'd have some data which would start to separate the men from the boys.

I hope I have been able to plant a seed and there are enough enthusiasts out there willing to participate to make this whole thing possible. I'm ready to give it my best shot.

Doug Dehnert  
Universal Satellite Systems  
Division of Doug's Inc.  
St. Hilaire, MN 56754

**As this issue announces there will be some type of antenna 'shoot out' at Omaha. Measuring how fast the antenna goes together and how well is one way to do it. Measuring how good it works, or can work, is another. The two may not be mutually compatible. We'll see as the "rules" for the shoot out evolve.**

I attended the SPTS in Washington and can't thank you enough for making the program possible. I am a subscriber to CSD and I have purchased a number of the technical manuals which STT offers. Satellite TV is changing my life and I plan to share my excitement with everyone I can.

About a year ago I followed Robert Coleman's example of tracking down surplus microwave antennas. After my disappointments and several large phone bills I located a

number of high quality used antennas. I know that all CSD readers want their own system but perhaps lack the financial ability to purchase high grade equipment.

I have the following antennas available which I am willing to sell for a fraction of their original or present market costs or to trade them for receivers or LNAs. If anyone is interested in the antennas I can be reached (216) 779-8539 between 6:30 PM and 11 PM eastern time. The antennas available are (a) one 15' high performance Andrew, (b) three 16' Prodelin, (c) two 10' Cablewave and (d) two 10' Andrew.

Jim Budzilek  
27200 Detroit Road  
Westlake, Ohio 44145

**Before you RUSH to the telephone to try to talk Jim out of one or more of these antennas, consider the following: Jim does not tell us what the f/D of these dishes happens to be. For proper feeding in this service they should be between .3 and .6 with a .4 to .45 ideal. None of the antennas have mounts so you'll have to create your own mount. Lastly Jim does not tell us how many pieces the antennas are in; before you get too excited consider how you are going to move the reflector surface to your home. NOW - rush to the telephone!**

#### THE YEAR GOES FAST

Since obtaining the Howard and Coleman Manuals a lot has happened. The biggest problem has been the long waiting time for parts such as the Avantek VTO which took four months to arrive. HP was not too bad for the GaAsFETs and bipolar transistors; a couple of weeks. I want to compliment one of the CSD advertisers (Satellite Innovations) from whom I received a nice assortment of chip capacitors nicely packed in just a matter of days. I ran into one major problem...getting an etchant for fabricating the Teflon LNA, mixer and oscillator boards. I finally solved the problem by going to a local plastic supplier. I plan to have two complete receivers constructed; one at 'work' and another at 'home', plus a third that is being constantly upgraded. I also plan to use an Avantek VTO as a signal source for proofing and aligning the equipment. Best of all I expect to have the three units operating for under \$1200. Thanks to CSD and being involved with satellites this past year sure has gone fast!

Tom Mogilnicki  
1139 Crescent Street NE  
Grand Rapids, MI 49503

**It occurs to us that there should be a large amount of 'second generation' Howard and Coleman tips and tricks now tucked away in do-it-yourself shops around the country. If you've found a better, cheaper, easier (etc.) way of making receiver system or sub-systems work let us hear from you. Provide sufficient details on what you have done, what parts it takes and where you get the parts so others can benefit from your work. We'll print it.**

#### READY TO TOUR

In regards to Coop's construction of a chain of television stations in the Turks and Caicos, I would like to offer my Professional Wrestling Program 'World League Wrestling' to the program schedule. I feel our program would be fine entertainment and we may be able to co-venture a live event promotion on one of our tours. Our television program currently airs on Satellite Program Network.

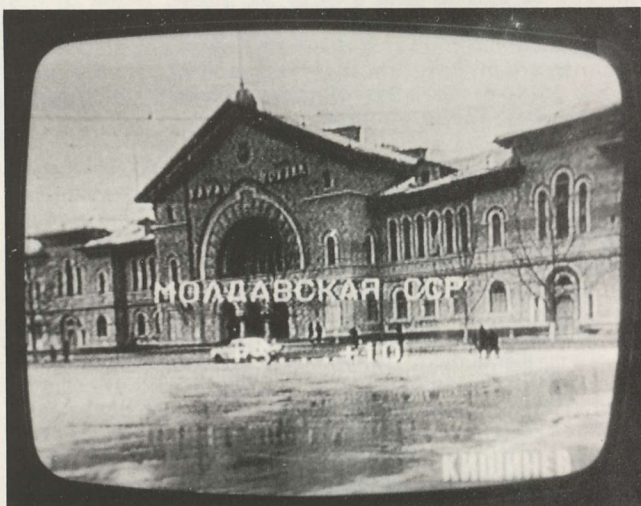
Lars Anderson  
President  
World League Wrestling  
P. O. Box 11593  
Atlanta, Georgia 30355

Wrestling is the number one spectator sport in the Turks and Caicos. We dare say that if somebody actually brought a 'live' professional wrestling event to the islands 7,599 of the islands total population of 7,600 would turn out. The one missing would have to be left tied to the local telephone company's operator board where all 6 lines in and out of the country terminate to explain why nobody was home should any overseas calls come in while the event was on.

#### PRETTY SHARP

With our 8 meter range self constructed screen mesh dish we believe we are getting excellent quality signals from Intelsat IVB (the Brazilian 18 hour a day feed) and Ghorizont 2. Enclosed are some photos showing our results as of early April.

Hector Posada  
Medellin, Columbus



MOSCOW in Columbia



RIO in Columbia

#### TV IN BRAZIL

I've read the CSD articles concerning the EIRP footprint reports in the Caribbean and Central America. These reports are very helpful and I have filed them away for future reference. However, I am interested in the EIRP footprints available in Brasil. Do any of the US domestic satellites reach Brazil? What about the INTELSAT birds? Also, how do you get

information on programming relayed by these birds?

I speak fluent Portuguese and am interested in marketing private TVRO terminals in that country. However I know very little about the laws or what is available there now. I enjoy CSD and it is extremely helpful and informative. I only regret that it is published once per month rather than once per week!

Richard S. Mull  
P. O. Box 50987  
Jacksonville Beach, FL 32250

The only US birds that might reach into Brasil (the northern edge with the northwest edge being most likely) is the COMSTAR D2 and D3 birds when they are transmitting on the Puerto Rican boresight beam. It is likely that on the PR boresight you could have 26 dBw signals (20 foot antenna level stuff) down perhaps into the northwestern 1/3rd of the country. Most of the programming sent on this boresight is occasional in nature, sporting events and specials with perhaps an 'average' of an hour a day or so (heavier on weekends). INTELSAT IV-AA at 24 degrees west (nominal) places a 26 dBw level signal over all of Brasil. It carries for about 18 hours per day the Rede Globo TV Network for satellite feed from Rio and Sao Paulo to several dozen Brazilian TV stations. This is a high quality service, not unlike NBC or CBS or ABC here in the states. A 20 foot antenna with right hand circular feed and 120 LNA will produce perfect pictures from this bird all over South America (see photo of this reception from some fellows in Columbia in this issue).

#### BIG BLOW IN VANUATU

In the early hours of February 12th we were visited by tropical Cyclone Cliff with top wind speeds recorded of 108 knots. I thought fellow CSD readers might be interested in knowing what can happen to a parabolic antenna when utilized as a sail in such winds. The dish...or I should say remains of a dish...is shown in the photograph. It is pointing south here, where the winds dumped it. The day before it was pointing north at INTELSAT IV/F8. Well, back to the drawing boards and workshop for a couple of months or so while a new antenna is built. I suspect this photo makes a good 'advertisement' for mesh sphericals and dishes!

Pete Duddy  
P. O. Box 349  
Port Vila, Vanuatu  
South Pacific



That's the first dish we have seen with a self supporting lower lip Pete!

**SATELLITE OPERATIONS MANUAL** by Bob Cooper reveals innermost secrets of satellite operations, who uses them, how and where. ALSO extensive coverage of simple tricks to improve reception, troubleshoot terminals, maintain high performance, locate special services.

**NELSON PARABOLIC MANUAL** by Nelson Ethier describes theory behind and step by step construction of 10 and 12 foot fiber/metal sandwich high performance TVRO antennas. Literally a manual to start an antenna business in your garage! Includes complete mount, feed instructions.

**GIBSON SATELLITE NAVIGATOR** - superb treatment of antenna mounts, tracking systems, full understanding of how complex world of geostationary orbit belt can be reduced to simple layman terms. No satellite buff should venture through the skies without it!

- \_\_\_ **YES** - Enter my order for **Coop's Satellite Operations Manual** via first class mail. \$30 (\$35 outside US, Canada, Mexico) enclosed.
- \_\_\_ **YES** - Enter my order for **Nelson Parabolic Antenna Manual** via first class mail. \$30 (\$35 outside of US, Canada, Mexico) enclosed.
- \_\_\_ **YES** - Enter my order for **Gibson Satellite Navigator Manual** via first class mail. \$30 (\$35 outside of US, Canada, Mexico) enclosed.

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**SATELLITE BUSINESS MANUAL** by Coop provides full business game plan for selling, installing private satellite terminals as a business venture. Includes comprehensive look at most of the equipment now on the market, discusses dealer/supplier relationships.

**"NEW" HOWARD TERMINAL MANUAL** - As modern as the 1981 satellite industry; this newly revised edition covers the construction of the Howard Terminal receiver following the highly popular circuit boards available. Thousands have been built; this one tells how to do it!

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\_\_\_ **ENTER MY** US/Canada/Mexico one year subscription to **Coop's Satellite Digest**; \$50 (US funds only) enclosed.

\_\_\_ **ENTER MY** outside-of-US/Canada/Mexico one year subscription to **Coop's Satellite Digest**; \$75 (US funds only) enclosed.

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**12 MONTH  
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REGISTER IN ADVANCE

# SUMMER '81 SPTS AUGUST 14-15-16 IN OMAHA, NB.

**BACK TO THE BASICS** - Omaha in August. During the past year more and more emphasis has been placed on the business aspects of selling and installing satellite television. Pushed to the background have been the basic how-to-do-it experiences of those who have **created** this industry. Omaha will be the big gathering of the year for those people who have the ability and experience to teach this new technology, and those who want to learn. If you come to Omaha, **come prepared to learn why and how this whole system works.** Be prepared to work with equipment and participate in shirt sleeve sessions designed to bring together the engineers and technologists of this industry!

**SIGN ME UP for SUMMER '81 SPTS IN OMAHA** - My registration fee of \$150 is enclosed. Return to me confirmation of my registration and motel registration information.

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SUMMER '81 SPTS P. O. Box G Arcadia, OK 73007

**PERFECT TVRO SELLING TOOL!** Coop has prepared a very special 12 minute videotape describing the home satellite revolution, the services available via satellite, and a layman's overview of what equipment is required. This tape is designed to assist TVRO dealers and distributors



to explain just what TVRO service is, on a one-on-one (in home) basis or for public displays such as service clubs. Also on same tape, approximately 50 minutes 'Coop Talks To Dealers'; a frank discussion of equipment quality and marketing approaches.

\_\_\_\_ **SEND** 'Satellite TV Story' on \_\_\_\_ VHS \_\_\_\_ BETA (**specify** which); \$60 enclosed in US funds.

\_\_\_\_ **SEND** 'Satellite TV Story' on \_\_\_\_ VHS \_\_\_\_ BETA (**specify** which) **with custom video 'tag' identifying our business as follows (name, address, telco):** \_\_\_\_\_

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Join SPACE today with payment enclosed (US funds only)

**S.P.A.C.E.**  
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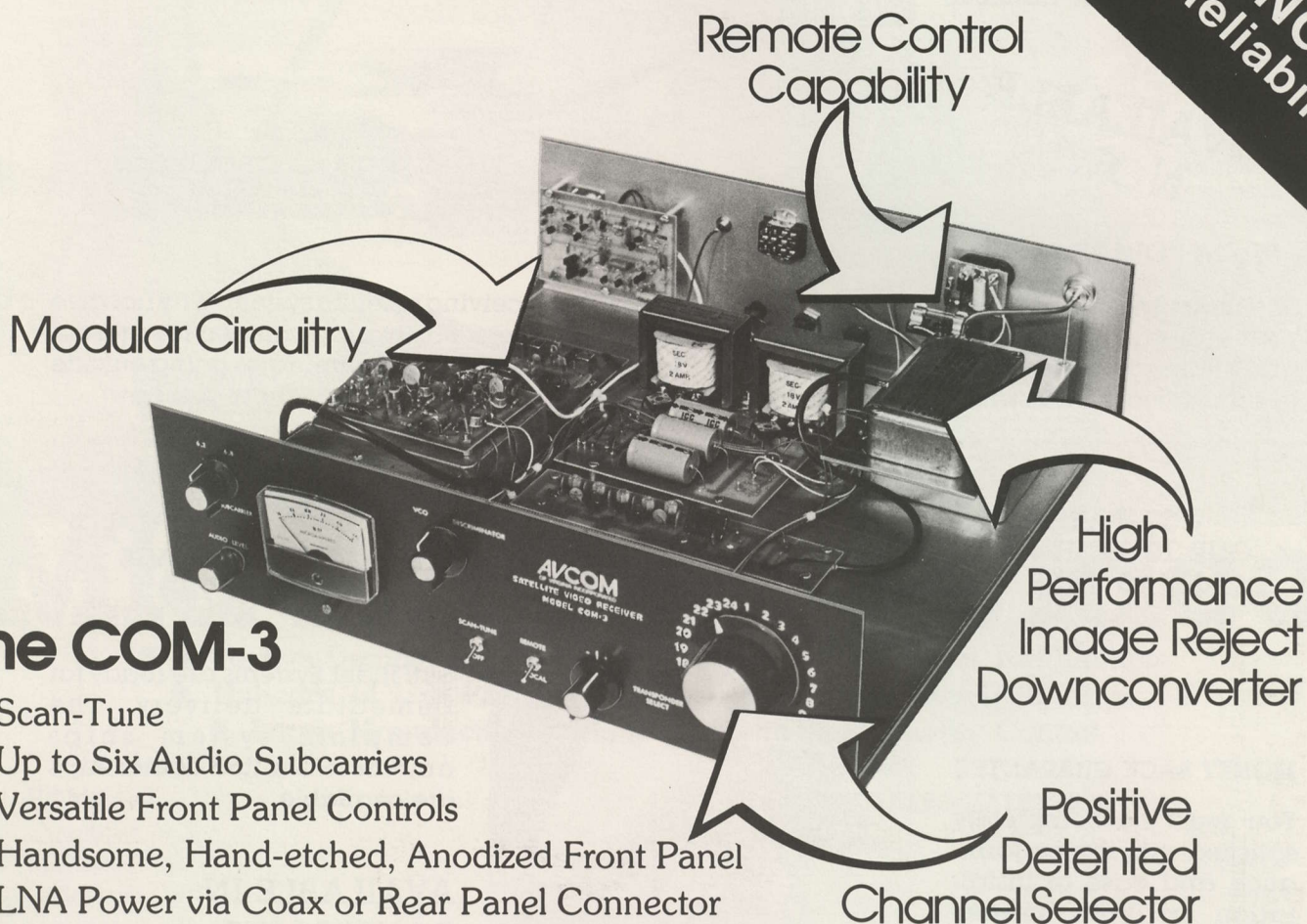
SATELLITE TV STORY  
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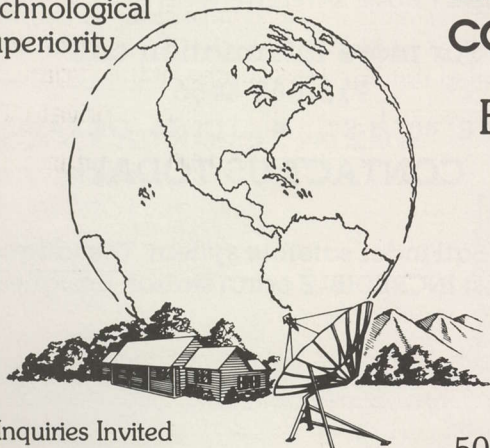


### The COM-3

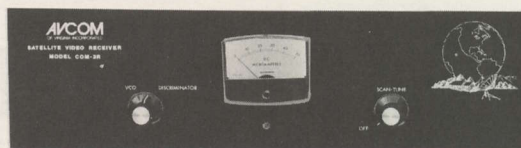
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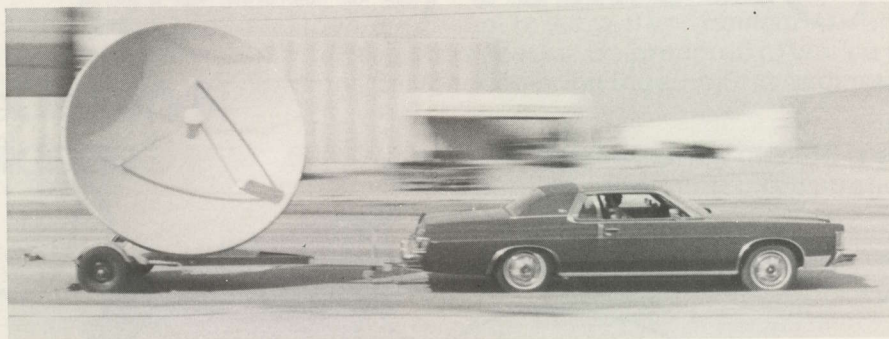
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SatFinder Systems pioneered the FIRST quality ROTATABLE receiving satellite system. Why not give your customers 10 **TIMES** as many channels for very little more. Easily programmed for present and future satellites with just a *touch* of the button. The SatFinder System eliminates going outside to adjust gears and switches or using bulky motors and heavy wires. Let us show you how!



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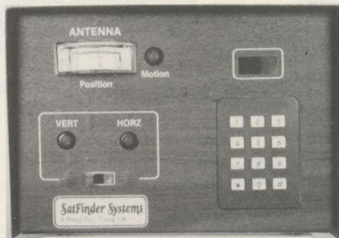


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SatFinder Systems are ready for immediate delivery. The complete system ships anywhere. **Limited dealerships are available.**

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SatFinder command control allows you to instantly select any satellite you choose with just a *touch*!

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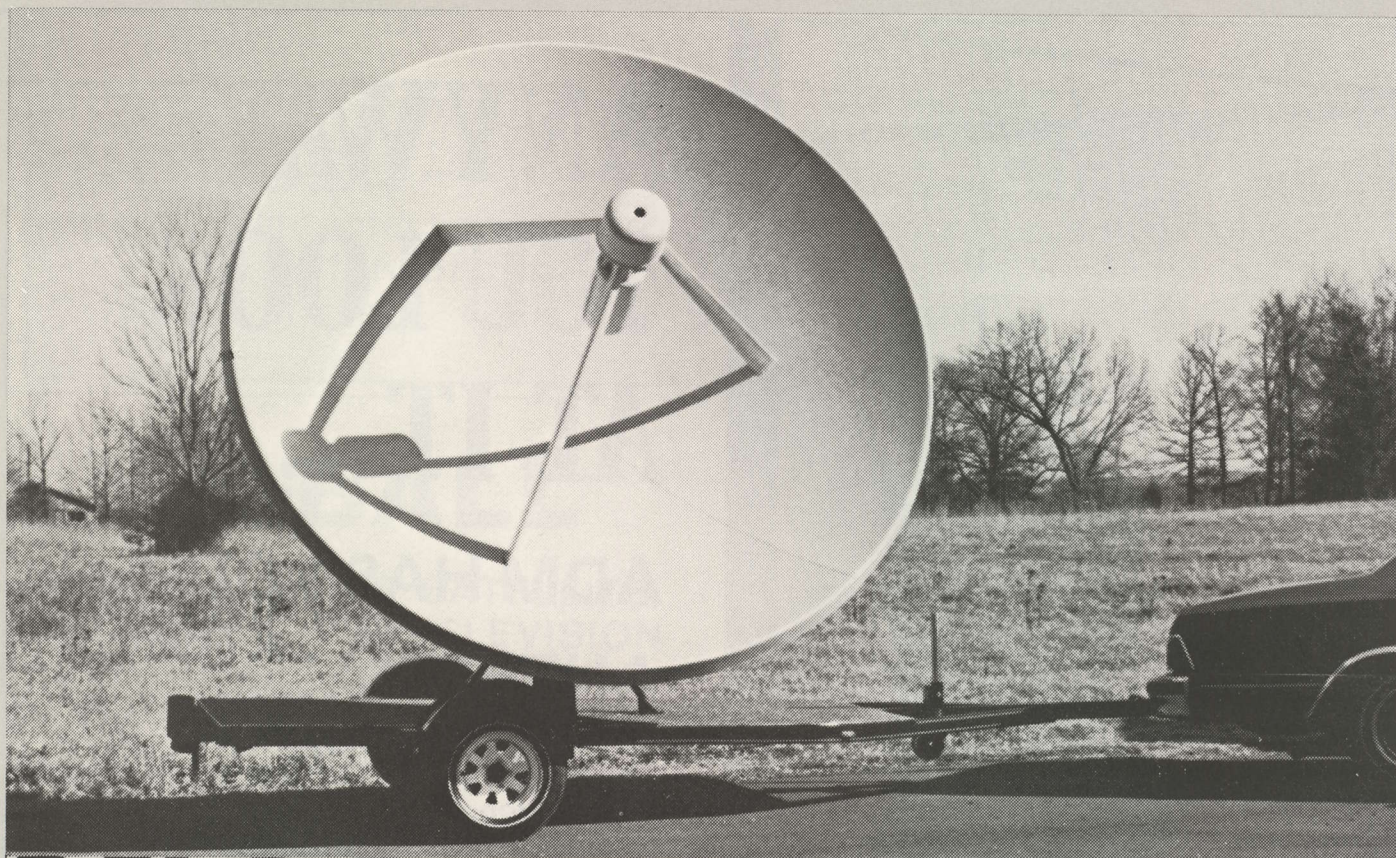
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Galaxscan 10'	\$3995
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## DISHES

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13'	\$1150
16'	\$1995
20'	\$3495

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(Includes: mount, dish, LNA mounts, Rotor Motor, feedhorn)

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1 LNA	\$695
3 LNAs	\$645 ea.
10 LNAs	\$625 ea.
25 LNAs	\$595 ea.
100 LNAs	\$575 ea.

50 Db gain minimum

Galaxscan 660 Receiver 6268 audio, Comtech, KLM

All off shelf delivery


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Commercial Quality with 6.2-6.8 audio remote control also available	
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**A SUPER TVRO ANTENNA SYSTEM.** High quality panelized aluminum 11 foot dish and steel polar mount. Dish weighs approximately 200 pounds, mount 265 pounds. Precision designed, easy installation, zinc chromate base primed and heavy duty white top finish. The rotating feed is standard! Easily shipped and installed. Choice openings for dealers and distributors.



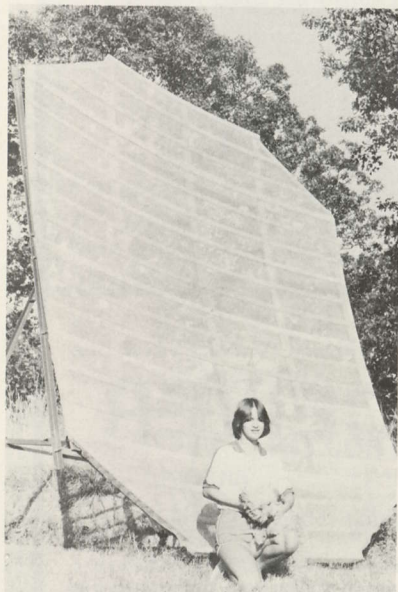
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**NOTICE!!** — Vidiark Electronics, pioneer of the famous "8-Ball" satellite antenna has developed and is now in production of an all new **high performance** satellite receiver. Also, from now on, will be operating under the name of **McCullough Satellite Systems, Inc.**

## The **8-BALL**



**SATELLITE  
TELEVISION  
ANTENNA**

**HAS  
IT  
ALL**

**PRICE:** Less than half the cost of other antennas.

**PERFORMING:** The "8-Ball" consistently out performs all other antennas of equal size.

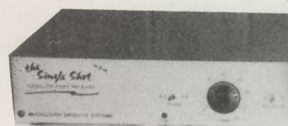
**DURABILITY:** With its open mesh surface and wide stance frame. The "8-Ball" will survive winds fatal to other antennas.

**APPEARANCE:** Blends in pleasantly with the environment.

Size	1-3	4-Up	Heavy Mesh	Extra Bracing	Galvanized Frame
8-ft.	\$495	\$395	30	25	65
10-ft.	550	445	45	40	80
12-ft.	595	475	60	50	100

Avantek LNA ( 120° In Stock.....\$730.00  
Microdyne Commercial Receivers ....\$2600.00

## The McCullough Receivers



**Single Shot  
\$1085**



**Skyline  
\$1285**

### — FEATURES —

- Removable downconverter - can be left in receiver **or** placed at antenna
- Single conversion with image reject mixer
- 6.2 & 6.8 Audio - others on request
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- Modulator power jack (+12vdc)  
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- Smooth action 10-turn tuning control with LED bar channel indicator
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Crystal controlled modulators (type used in home video recorders) - Ch 3 & 4, wired to plug in rear of receiver - Cost \$75.00.

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Galvanized .....\$25  
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## EXCEPTIONAL PERFORMANCE

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- **FULL FUNCTION METERING** - With selectable manual tuning and AFC disable allows checks of system CNR without additional equipment. Continuous monitoring of Signal Strength (in linear dB) and tuning error (in MHz).
- **VCR COMPATIBLE** - Video and audio levels allow use of your VCR as a modulator, providing immediate recording without cable changes when desired.
- **DESIGNED FOR RELIABILITY** - Careful cost/performance balance to insure continued quality reception.

## SUPERIOR VALUE

- **LOWEST IN-PLACE SYSTEM COST** - "Bargain" receivers stop being a bargain when you add up the antenna and LNA costs for sparklie-free reception with higher thresholds.
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# EARTH TERMINALS

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## Introduces the MODEL 12K SYSTEM...

A complete home satellite receiving system that you can assemble yourself as a week-end project.

Why spend \$7,000 to \$10,000? Why pay someone else to install it? Do it yourself in a week-end and save.

**Suggested Retail:**

**50**

**ONLY \$3,695.00**

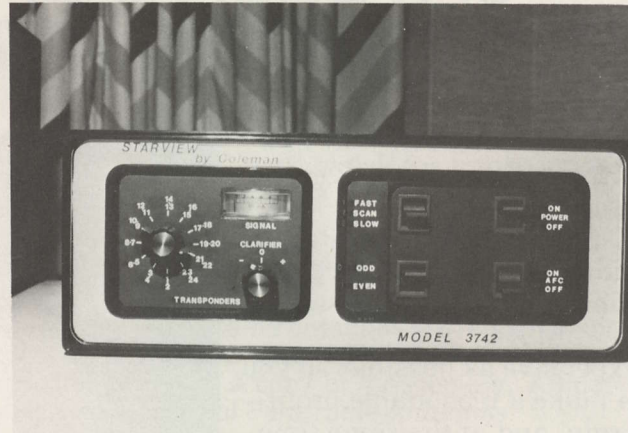
**Channels**

**KIT CONTAINS**

- 12' Antenna
- AZ/EL Mount
- 24-channel tuneable receiver
- 120° LNA
- Feed Horn
- All Miscellaneous Cable and Connectors needed
- Everything You Need
- No Special Tools Needed

**DEALER COST \$2995.00**

U.P.S. Shipable anywhere in USA.



## NEW!!! Coleman 3742 Receiver!

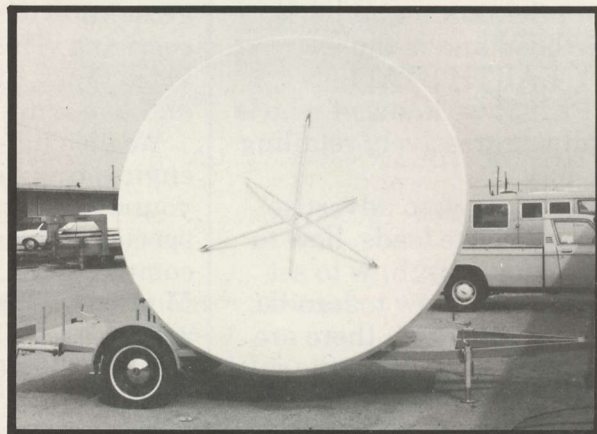
Scan-tuned, multiple audio sub-carriers, local or remote control, superior threshold performance, full metering, double conversion of course. And available exclusively from Starview Systems. Ask about early delivery today!

## LNA SUPER SALE - Continues!

**YOUR CHOICE** - 100 degree (!) K, 50 dB gain top of the line LNAs for just \$1095. OR - Avantek 120 degree K, 50 dB gain low noise amplifier with the new 'power block' DC coupling system that allows you to use your TVRO downline for powering! Instant delivery on this top grade LNA at the unbelievable price of \$795!

## STARVIEW DEALER SPECIAL

Get in on the ground floor as a TVRO dealer in your area! Starview Systems provides you with everything you need; professional instruction plus the finest mobile sales terminal on the road today. Included is a 10 foot Starview parabolic equipped with rotating feedhorn, Avantek 120 degree K LNA, top of the line Starview 24 channel tuneable receiver, 75' of coaxial and connection cables plus a trailer to get you to the demo site and operational in 30 minutes time. And the price? An unbelievably low \$6,495!!!



# STARVIEW SYSTEMS

**H & R Communications**  
Route 3, Box 103G  
Pocahontas, Ark. 72466

501/647-2001 • 501/647-2291  
1-800-643-0102

# Get in on the Ground Floor of Outer Space!

## SATELLITE EARTH STATION TELEVISION RECEIVER SYSTEM

Getting started in your new TVRO business can be very exciting!!

Especially when you start deciding on what kind of equipment you want to sell. You want it to be as inexpensive as possible, so you can make a reasonable profit margin, and at the same time be of good quality and delivered **PROMPTLY** so your customers will be glad they bought from you.

There are several firms across the country who sell one or more pieces of earth station equipment. The other firms usually have varying warranties, performance and delivery times, etc. However, there is another alternative...

Advanced Electronics, the Earth Station People, are offering a **COMPLETE TURN-KEY PACKAGE** to dealers that has complete dealer orientation and back-up included and is the **ONLY EARTH STATION SUPPLIER** we know of who is actually aggressively retailing every day.

We know how to advertise, how to generate leads, how to qualify prospects, how to set appointments, how to handle objections (of which there are few!), and how to close the sale!



Advanced Electronics, the Earth Station People, also has a full training program covering all facets of the Earth Station business from lead generation to installation and servicing. This consists of video tapes, printed materials, and live seminars.

We also have a complete engineering department at your disposal to handle any special problems. (We recently completed an installation in Montana where the dish and receiver are 3000 feet away from the home.)

We also feature a fully equipped and staffed service department reachable by our 800-634-6047 toll free number to promptly handle any requirements you may have.

As for advertising, we employ a full service agency to prepare printed materials, direct mail pieces as well as radio, television, billboards, magazines and newspaper ads. They will even place the advertising for your market at no cost to you for their services.

You can see that Advanced Electronics not only offers a turn-key system for the consumer, but also a turn-key system for all of our valued dealers:

1. Warehousing facilities to deliver the entire package from one source,
2. Sales knowledge to impart to dealers,
3. Engineering for any problems you have,
4. Total marketing and advertising programs, and
5. Complete service department.

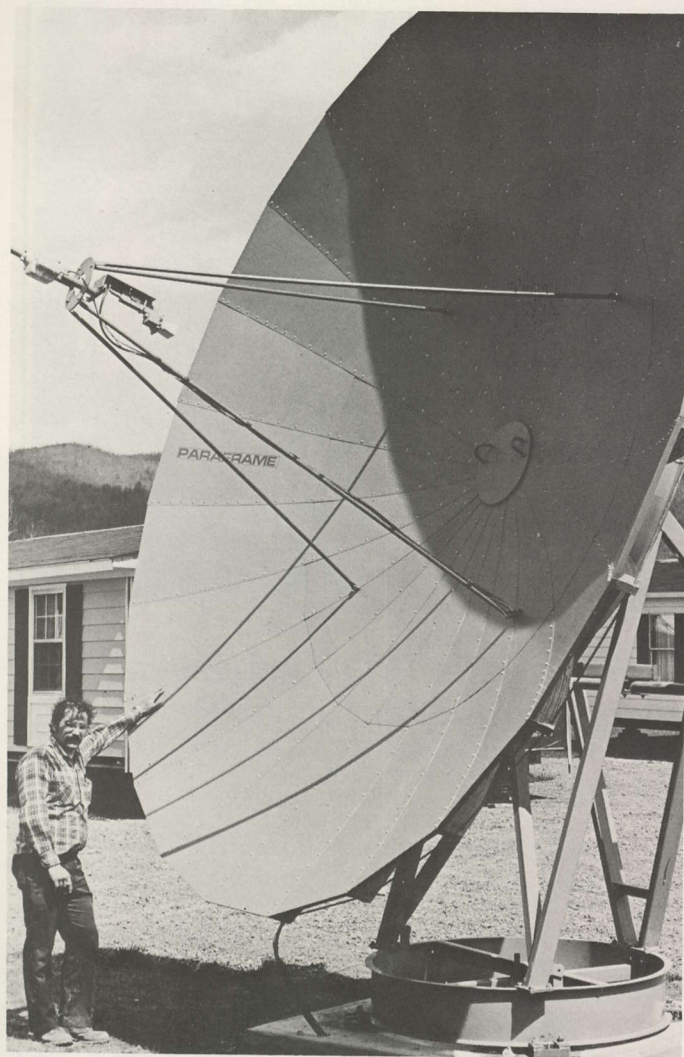
In short, Advanced Electronics, the Earth Station People, want to help you get started in this very exciting and rewarding business.

**THE SKY'S THE LIMIT!!**



ADVANCED ELECTRONICS, INC.  
5081 Arville Street, Las Vegas, Nevada 89118  
702-871-8766 or 800-634-6047

## THE EARTH STATION PEOPLE



## MORE GAIN — LOWER PRICES!

Paraframe antennas now come equipped with ultra high efficiency single or dual mode feeds from SEAVEY ANTENNA ENGINEERING. Gain is up 1.2 dB, yet edge illumination is down a full 16 dB.

Antenna	Old List Price	*New List Price	Old Gain	New Gain
ET/3.66	\$3390	\$2790	41.1dBi	42.3dBi
ET/4.85	\$5390	\$4375	43.5	44.7
ET/6.00	\$6990	\$5880	45.4	46.6

\*Add \$300 for dual mode feed.

## 1.2 dB MORE GAIN = 1.2 dB LOWER SATELLITE EIRP MINIMUMS!

If you buy a 100°K LNA and a true 7.0 dB threshold receiver with your Paraframe antenna you will enjoy threshold equalling reception with the following satellite EIRP's.\*

Antenna	w/old feed	w/SEAVEY feed
ET/3.66	30.4 dBW	29.2 dBW
ET/4.85	28.0	26.8
ET/6.00	26.1	24.9

\*EIRP's should be 1.5 dB higher for transponders with numerous subcarriers.

## PROOFED ON SITE — IT MUST BE RIGHT!

Learn how Paraframe antennas are adjusted and proofed at the job site for visually verifiable precision! Request a copy of "Assembly, Adjustment and Proofing of Paraframe Antennas."

## MAKE MONEY!

Demonstrate and sell Paraframe earth stations. Contact one of the following Independent Paraframe TVRO Contractors. He will help you design systems and bid competitively. He will do the turnkey installation and provide you with technical support.

## PARAFRAME DISTRIBUTORS

Delstar Systems	
Houston, Texas .....	713-776-0542
Earthstar Corp.	
Steger, IL .....	312-755-5400

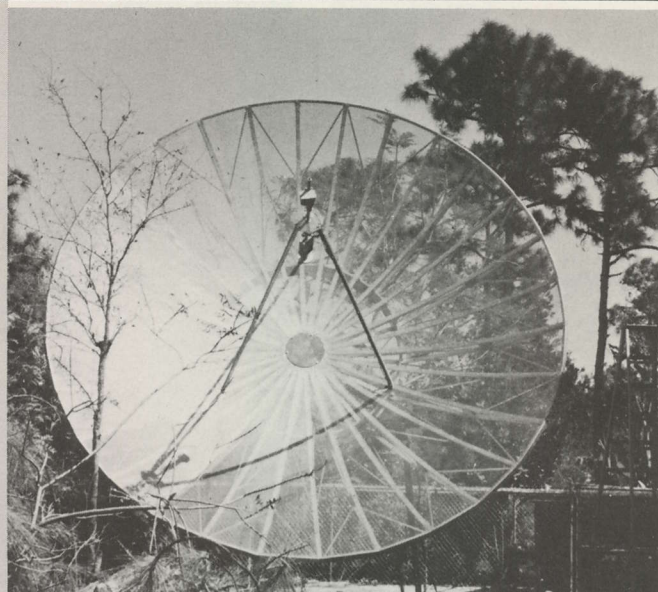
## DEALER - INSTALLERS

Roh's	
Tucson, Arizona .....	602-795-8573
W. H. Rose	
Saugus, CA .....	805-268-0696
New England Satellite TV	
Worcester, Mass. ....	617-757-2531
Peakecom	
Silver Spring, MD .....	301-587-2515
Altcomm, Inc.	
Ephrata, PA .....	717-738-2930
J. V. Electronics	
Landing, N.J. ....	201-347-3206
Mid-Continent Earth Stations	
Lincoln, Nebraska. ....	402-476-2211
Tri-Star Systems	
Jane Lew, WV. ....	304-624-5909

# PARAFRAME<sup>TM</sup>

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# SIX METERS BIG . . .



**READY for the TOUGH assignments anyplace on earth! Unequalled gain, superb control of side lobes, an outstanding performer for those 'off-boresight' regions where nothing less than the best will produce satisfactory pictures.**

- **THE ANTENNA** THAT HAS OPENED UP THE MIDDLE AND DEEP Caribbean to US DOMSAT service. Now available in 16 and 20 foot diameters with the industry's **only** rugged **horizon to horizon** motor driven remote antenna positioning control system.
- **BIG** but lightweight. Approximately 300 pounds total weight (actually weighs less than many 10 footers!); **no crane required** for installation, can be put in 'tight spots' where mounting space is at a premium.
- **FIELD** accuracy is proven on the site with a 'final-check' proofing template. Your big 20 foot surface is adjusted by the installer using our proofing jig so you **KNOW** that every fraction of a dB of gain is achieved with every installation.
- **EASILY** shipped in spite of its impressive size. The entire package is so carefully designed and well thought out that it ships and goes together with the precision of a fine instrument.
- **SMOOTH** operation. Touch the motor drive switch and watch the transponders zip by; from F1 on the west all the way to the INTEL SAT and GHORizont signals in the far eastern sky in just sixty seconds time!
- **HERO COMMUNICATIONS is now accepting applications for new dealers.** We offer the world's finest six meter antenna system (5 meters also) direct from the manufacturer. Our experience in solving tough installation problems will save you money and time in completing your own installations. We offer sound technical backup based upon years of experience in this field.
- **PLUS** - from HERO COMMUNICATIONS you deal with a warehousing distributor for WASHBURN, AVCOM, and ICM receivers, a complete line of accessories including 1/2 inch hardline, connectors, modulators AND the fantastic 85 and 100 degree DEXCEL LNAs. We manufacture and handle nothing but the field-proven-best equipment in the industry today. Whether you need a single connector or a complete system, HERO COMMUNICATIONS is here to serve you.



**HERO COMMUNICATIONS**  
1783 W. 32nd Place  
Hialeah, FL 33012  
(305) 887-3203

**EXCELLENCE IN PERFORMANCE THROUGH PRECISION ENGINEERING**

# ATTENTION DEALERS:

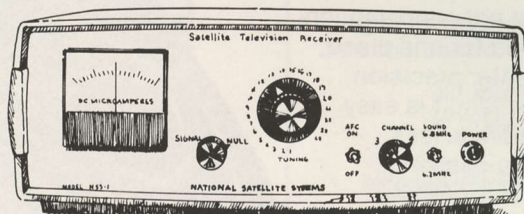
National Satellite Systems is one of the fastest growing distributors of TVRO Systems. Since 1978 we have placed no minimums on orders, no pressure sales, no conflicting dealer territories, we simply offer you excellent TVRO equipment at low prices to compete in the TVRO market. In most cases, delivery is from stock. Our staff at National Satellite Systems has over 82 total years of microwave experience. Also, we can be reached on the weekends for your convenience. We are constantly researching new products for our dealers.

National Satellite Systems has over \$60,000 of test & alignment equipment for after-the-sale service.

## AVAILABLE THIS MONTH:

### FEATURES:

1. Dual Conversion
2. Built-in RF Modulator
3. LNA powered thru cable
4. 24 Channel detent switch with fine tune
5. 6.2-6.8 audio switch
6. AFC control for no drift operation



**RETAIL PRICE \$1595**

7. Signal strength and carrier null meter control
8. RF Modulator channel select on front panel
9. Attractive cabinet
10. Down converter at the antenna
11. Remote control for tuner and signal meter available
12. Low prices for our dealers

NATIONAL SATELLITE SYSTEMS is proud to be the stocking distributor for the following lines of equipment:

**ANTENNAS** - 2', 4', 6', 8', 10', 12', 13', 15', and 20' diameters.

ADM - KLM - Mid America - Miralite - Prodelin - Vidiark - Wilson

**RECEIVERS** - 4 and 12 Ghz

Automation techniques - Comtech - Vitalink - KLM - National Satellite Systems - Microdyne

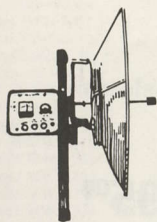
**LNA's** - 4 and 12 Ghz

Amplica - Avantek - MA/Canada

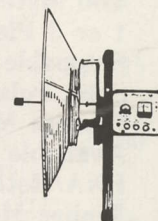
**RF MODULATORS** - ATV Research - Sony - Uhf Associates

Plus, miscellaneous little items in stock that are absolutely necessary to make every system complete.

## — GUNN PLEXERS —



Need to get your TVRO Video and Audio to some distant point? We have complete microwave transmitters and receivers to get you point-to-point over distances of 20 miles or more! Complete systems from \$995.



## NATIONAL SATELLITE SYSTEMS

Division of

SOUTHWESTERN SATELLITE SYSTEMS

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Albuquerque, NM 87107

Phone (505) 883-3626 Monday thru Saturday

## We Couldn't Settle For The Best . . . . . So We Made It Better

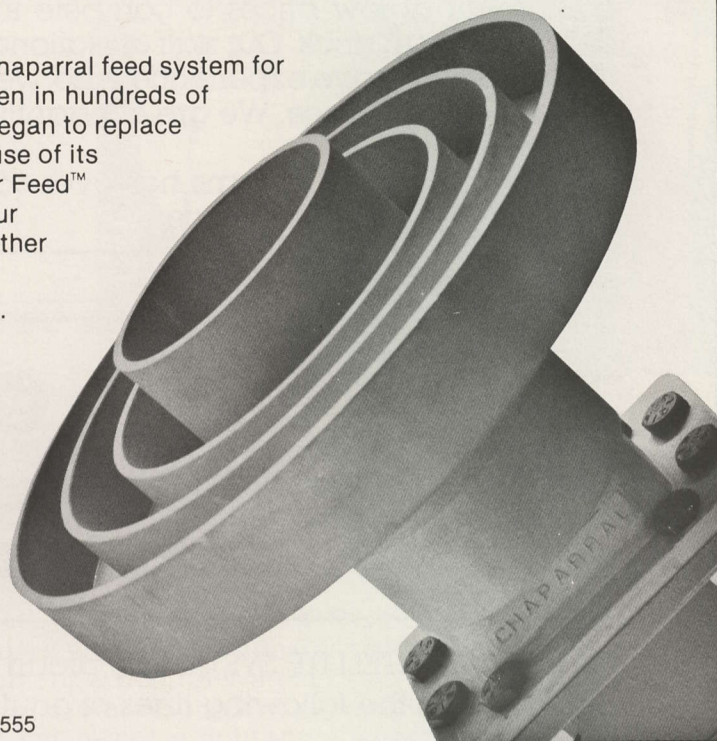
Taylor Howard helped us design the first Chaparral feed system for satellite antennas. After having been proven in hundreds of installations, the Chaparral Super Feed™ began to replace horns and other non-precision feeds because of its increased antenna gain. We called it Super Feed™ because we found that antenna gains in our systems went up as much as 1.5 dB over other devices on the market.

That was pretty good, but not good enough. So we developed a method for one-piece casting that provides greater precision and improved VSWR. The result is easy assembly, better performance, less cost and the best feed you can get for dish f/D's in the .3 to .5 range.

Super Feed™ is in production now and ready for immediate delivery at \$125 per unit or at quantity discounts.

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COMMUNICATIONS**

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3.25 Meter  
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Shippable Anywhere  
Solid Polar Mount  
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624-6116**

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**Startrak RL8530D**

### FEATURES

- Down Link at Dish
- RG-59 To House
- LNA Power
- Rotor Power
- Modulator
- Signal Strength Meter
- AFC/Manual Tuning
- Switch Stop Channel Selection
- 4 Channel Audio
- Studio Quality Picture

Dealer Net **\$1695<sup>00</sup>**

LNA's 120° 40DB - **\$495<sup>00</sup>**

Model SL200B Commercial Quality Rack  
Mounted RCVRs - **\$1745<sup>00</sup>**

## Alaska Microwave Labs

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(907) 338-0340

CHIP RESISTORS		PISTON TRIMMERS	
50 OHM 1/2 Watt \$1.50		Triko 201-01M .5-3Pf, 1-8Pf, .3-1.8Pf \$2.50	
COAX CONNECTORS		RF - IF I.C.	
BNC		NEC MC 5121 75 OHM	
Chassis mt. sq. flange	\$1.95	4 terminal in, out, GND,	
Plug for RG-58	\$1.95	& VCC 30 to 890 MHz	
SMA		plus/- 1DB Typ 27DB	
Chassis mt. sq. flange	\$6.10	gain plus 20V VCC	\$13.00
Chassis mt. plug sq. flange	\$8.50	NE 564 PLL	\$7.65
Chassis mt. strip-line tab	\$6.75	NE 592 Video AMP	\$1.75
Plug for RG-58	\$6.75	MC1358 (CA3065) TV	
Plug for RG-174	\$6.75	Sound System	\$2.50
Plug for .141 semi-rigid	\$3.98		
Type N			
Chassis mt. sq. flange	\$3.25		
Plug for RG-9/RG-8	\$3.75		
Double Male	\$7.25		
RF-CABLE		TRANSISTORS	
.141 Semi-rigid Cable		MRF 901 FT4.5 GHz	\$3.00
Approx. .24DB Loss per 100 ft		MRF 911 FT5.0 GHz	\$4.00
@4GHz price is per ft plus/		BRF90 FT5.0GHz	\$3.00
-1/4 inch max length is 5 ft.		BFR91 FT5.0GHz	\$3.50
Other lengths by		NEC 02137 FT4.5GHz	\$3.25
special order	\$4.00	NEC 02135 FT4.5GHz	
FEED-THRU CAPACITORS		Typ NF 2.7DB MAG	
1000 Pf Solder Type	\$5.50	15DB @ 2.0GHz	\$5.00
470 Pf Solder Type	\$5.50	NEC 64535 FT8.5GHz	
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MBD 101 UHF-Micro	\$1.50	@ 2.0GHz	\$14.00
ND4131			
4GHz NF-5.75DB	\$21.00		
HN-1 4GHz NF-6.5DB	\$2.00		
FERRITE ISOLATORS		CHIP CAPACITORS	
3.7 to 4.2 GHz MAX Loss .4DB		1.2, 2.2, 3.3, 4.7, 6.8,	
Isolation 20DB min,		10, 18, 22, 27, 47, 100,	
VSWR 1.25 MAX	\$115.00	120, 180, 220, 270, 330,	
GaAs FETS		390, 470, 560, 680, 820,	
MGF1400 NF 2.0 DB		1K, 1.2K, 1.8K, 3.9K, 8.2K,	
@4GHz MAG 15DB \$28.50		10K, 100K	\$6.50
MGF1412 NF 0.8 DB			
@4GHz MAG 18DB \$75.00			
DUAL GATE MOSFET			
RCA 40673	\$1.50		

OPEN AT 8PM EST CLOSED 8PM PST

ORDERS ARE POSTAGE PAID  
COD-VISA-MASTERCHARGE

IF YOU DO NOT SEE WHAT  
YOU WANT, ASK!

## THE RETRO FIT KIT MOTORIZED ANTENNA ACTUATOR

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### 50-60 CHANNELS

INSTEAD OF 20

- Fits all existing 2 1/4" screw jacks.
- Simple installation (1 person approx. 1/2 hr.)
- 115V AC operation (no batteries)
- Simple instructions included for 2-switch control installation.

*No more hand-cranking and  
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ONLY \$236.00

Includes motor, couplings, aluminum  
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AVAILABLE SOON:  
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DEALER INQUIRIES WELCOME.

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ELECTRONICS**



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### 70 MHz DEMODULATOR CARD

The Sat-tec D-1 demodulator is the last block in a TVRO system, it is where the 70 MHz IF signal is converted to video and audio. The D-1 contains a PLL demodulator, video processor (CCIR de-emphasis, 4 MHz low pass filtering and 30 Hz clamp), dual sound sub-carrier demod and AFC circuitry. The power requirement is small, 15VDC @ 200ma., signal input is -20dbm @ 70 MHz. AFC will enable the user to lock most any VTO L.O. with no problem whatsoever. Video and audio outputs are a standard 1 volt p-p suitable for driving any monitor, VTR, or modulator.

#### SPECIFICATIONS:

Signal input: 70 MHz at -20dbm (22mV)  
AFC lock range: greater than 5 MHz  
Sound subcarriers: 6.2 MHz and 6.8 MHz fully independent  
Video level out: std. 1 volt p-p  
Audio level out: 1 volt p-p  
Power requirements: 15VDC @ 200ma  
Demodulator: NE564 PLL IC  
Tuning voltage out: 2 to 13.5 volts  
Tuning voltage in: 0 to 15 volts max

D-1 Demodulator Kit		\$99.95
D-1 Demodulator PC board only		\$49.95
Part Number	Description	Price Each
Avantek GPD 1002	1GHz, 12 db gain TO-8 can amplifier, 15VDC	\$45.00
Watkins-Johnson V802	2.5-3.7GHz VTO, lower noise than Avantek types	120.00
Watkins-Johnson V705	600-1000MHz VTO, lower noise than Avantek	120.00
Signetics NE564	PLL selected to operate at 70MHz	7.50
Van-L DBM-500	4GHz mixer, SMA connectors	85.00
Amperex ATF-417	1GHz, 25db gain hybrid amplifier, 20-24VDC	19.00
Motorola MWA-110	400MHz, 14db gain, -2.5dbm	9.00
Motorola MWA-120	400MHz, 14db gain, +8dbm	9.75
Motorola MWA-220	600MHz, 10db gain, +10.5dbm	12.40
Motorola MWA-230	600MHz, 10db gain, +18.5dbm	13.50
Motorola MWA-310	1GHz, 8db gain, +3.5dbm	12.40
Motorola MWA-320	1GHz, 8db gain, +11.5dbm	13.50
Motorola BFR-90	3GHz F <sub>T</sub> NPN transistor, 15db gain @ 1.2GHz	2.50
Motorola MRF-901	3GHz F <sub>T</sub> NPN like BFR-90 but 2 emitter leads	2.75
Regulators 7800 Series	5V, 8V, 12V, 15V, 1A TO-220	1.50
Regulators 7900 Series	-5V, -8V, -12V, -15V, 1A TO-220	1.75
IF Transformer	10.7MHz IF can be padded to 6.2 or 6.8MHz	1.25
Tuning capacitor	10pf multi-turn for filters, PLL, etc.	.95
Coil form + can set	Nice coil form set for filters, good to 120MHz	2.00



Sat-tec Systems; Box 10101  
Rochester, NY 14610; (716)381-7265



TERMS: CASH ON DELIVERY  
OR 30 DAY PAYMENT  
IN ADVANCE. ALL PRICES  
INCLUDE SHIPPING AND  
HANDLING CHARGES.

## STAR TRAK SYSTEMS, INC. EXPANDS!

RLS8530D Receiver	\$1695
SL200B Commercial RX	1745
LNAs	495
Dealer Demo Package	4995
Complete Systems	4240
Motor Drive	295

Need Parts? We probably have 'em...  
Modulators — 3-4 switchable

IN STOCK \$79.95

VTO — WJ907  
IN STOCK 120.00

WHY PAY MORE???

We manufacture our own receivers, LNAs, dishes, stands & motor drive assembly. Buy at factory prices. Quantity pricing on some items.

CALL TODAY FOR DELIVERY

8530 Woodcrest Dr.  
Colorado Springs, CO 80908 (303) 495-4020

## 100 K / 50 dB GAIN

### Low Noise Amplifiers

**A MAJOR BREAKTHROUGH** in low noise amplifiers! AB Electronics pushes back the LNA 'noise barrier' by an important 20 degrees from standard 120 degree units and delivery is from stock!

**50 dB of gain** (minimum), **100 degrees K** (maximum) across the full 3.7 to 4.2 GHz range. A major brand LNA with credentials you have to see to believe. And at a price more than 20% below previous 100% units. **The ultimate LNA; priced at just \$995!** Call for full details.

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## QUANTUM

Rotating Antenna Drive  
With Position Indicator

**REMOTE-CONTROL  
ALL DISH MOVES BY  
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QUANTUM  
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Zenith VR900W w/BETASCAN **\$699**

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TDK T-120 VHS Tape 10/**\$149**

Sony KP 5020 Projection TV **\$1,849**

Kloss Novabeam (Call for Price)

For information, please call after 4:00 PM (201)347-3206

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Joseph Valentino, President

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## RF MODULATORS

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Switchable Ch. 3 or 4 Wired and Tested

2 Phono Jacks - Audio - Video in

1 "F" Fitting Audio - Video out

Requires 12V Power

**'99<sup>95</sup>** Without Power Supply

**'119<sup>95</sup>** With Power Supply

**S. T. E. S. Inc.**

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Petersburg, WV 26847

Phone 304-257-4577

Visa - Master Charge

## LNA's for ANY budget!

## LOW COST 100° K 50 dB Gain

An excellent average performance LNA that won't empty your pockets. These ready-to-install units are specially priced.

MODEL NO. LC/100—100° K 50 dB Gain ..... \$ 950.00

MODEL NO. LC/80 — 80° K 50 dB Gain ..... 1695.00

## HIGH PERFORMANCE LNA

INTRODUCING...a new Low Noise Amplifier that drops the kelvin rating to HALF the present 120° K standard. Based on a new design concept, the remarkable **XCEL-N-A/60** permits the use of smaller dishes and even sphericals with excellent reception. All prices FOB Hartford, CT.

MODEL NO. XLC/60 —60° K 50 dB Gain ..... \$2995.00.

**Satellite Electronics Systems, inc.**

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PARABOLIC

ANTENNA

including

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Fiberglass Antenna in 12, 30" Sections

Steel Mount Tracks All Satellites

12' - f/d - .45 - **\$1100<sup>00</sup>**

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\*Shipping Not Included

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## DEEP SPACE COMMUNICATIONS, INC.

12-foot diameter parabolic fiberglass antennas - 2 or 3 piece construction. Polar mount with spars and remote control rotor.

Total package price ..... **\$1,850**

**DEEP SPACE COMMUNICATIONS, INC.**

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## GENUINE HOWARD TERMINAL PC CARDS

Bob Coleman and Tay Howard are now producing six PC cards which make duplication of the Howard Terminal (latest version) a snap!

(A) Dual Conversion (4 GHz to 70 MHz) - \$25.00

(B) 70 MHz IF and Filter - \$25.00

(C) Howard Demodulator - \$40.00

(D) Dual (2 channel) Audio - \$25.00

(E) Single Channel Audio - \$15.00

(F) AFC and Metering - \$15.00

**Order from:** Robert M. Coleman, Rte. 3, Box 58-A  
Travelers Rest, S.C. 29690

## COOP'S COMMENT ON PROGRAMMING

### THE WINDS OF CHANGE

The Washington, DC SPTS was a bit of a revelation for those who have followed the seminar 'trek' for low these many years. I don't know about the other veteran SPTS attendees but I believe I detected the first seeds of a substantial new direction for this young industry.

First there was the announcement, never formal but frequently discussed, that the **Channel Master Corporation** would be in the home satellite terminal business shortly. Channel Master saved their formal disclosure for a gathering of the nation's electronic wholesale distributors held in Atlanta over the 5th-7th of May. CM has been carefully studying this industry since the February 1980 SPTS in Miami and recently obtained an agreement from KLM whereby the KLM single conversion receiver design will be manufactured for CM under their own label. The significant part of this report is that Channel Master has one of the most well developed national distributor/dealer networks in home electronics and they therefore possess the capacity to go 'nationwide' in one jump. Not to be outdone by the CM announcement, Blonder Tongue has signed a deal with Scientific Atlanta to handle SA terminal packages; BT of course is also feeding a well matured network of national distributors and dealers. Jerrold Electronics, meanwhile, has purchased the rights to manufacture a line of 4 and 12 GHz terminal hardware from the Canadian firm SED Electronics and this may also suggest that the 'big J' will be selling US terminal packages soon. Of the major firms in the **home TV** parts business, only Winegard seems to be sitting it out and we don't expect them to continue to do so long since firm founder and President John Winegard has attended many of the recent SPTS/SBOC events.

Of these three new firms in the field, CM and Jerrold have considerable experience in packaging electronic hardware off shore and then bringing it to the US ready to sell. CM has a substantial plant in Taiwan; Jerrold uses Mexico. The off-

shore 'angle' came up in another corner at SPTS '81 Washington; from the well known folks at DEXCEL.

**Now DEXCEL** has been with this industry from the very first SPTS in 1979. Art Kawai, Yozo Satodo and the DEXCEL team have been active in seminars and in working to push LNA technology to new heights. They were first with reasonably priced 100 degree units and their 85 degree units are now considered state of the art for those of us who need that extra fraction of a dB in lower noise temperature. DEXCEL previewed a combination LNA plus downconverter in March; the entire unit is barely different visually from a standard DEXCEL version LNA and with it you leave the antenna **at 70 MHz**. At Washington they stopped the show with the rest of this package; a snappy designed complete home receiver/LNA package. The LNA and downconverter technology is American, for now. The balance of the receiver is Japanese.

**Now allow me to postulate just a bit.** The name of the game in Japan (or Taiwan or Mexico) is quantity. In our field 1,000 complete receivers per month is a pretty decent quantity and since this has to represent no less than \$1,000,000 per month in OEM pricing (1000 x \$1,000) it is practical to think in terms of \$12,000,000 to \$20,000,000 per year in annualized shipments for packages such as this at the Japanese / Taiwan source. DEXCEL plans to have **their new LNA plus receiver package** available in the states "in quantity" around the first of August. Their package will carry a user suggested pricing in the \$1995 region. Distributor / dealer pricing is reported to be at least 30% off of suggested user net; lower for substantial purchases. Remember this is for an **LNA plus a full receiver**.

The combination of Channel Master and DEXCEL, both new to the marketplace, is going to send shock waves through the existing marketplace. Both have the expertise and dollar resources to produce product in large quantities and to back up that product with highly visible marketing efforts. By the start of the fall TV 'season' both will be ready to go in the marketplace.

Older line firms are hardly standing still however. International Crystal showed privately their new **two-piece** double conversion package at Washington; KLM trotted out their own version of an LNA plus downconverter package. Others reacted by indicating their conversion stages could be hung separately at the antenna.

**The competition is going to stiffen up this fall.** A few of the 'old line' firms will probably find the going a little rough. For dealers and distributors the opportunities to add new lines and expand marketing opportunities will be better than in any previous period of our history. With the new entrants and **mass marketed** hardware will come new mass marketing strategies and a new visibility for home terminals in the marketplace. The marketing opportunities we can all adapt to; the increased visibility, coming as it will when numerous new pieces of federal legislation are being considered to 'curb' home terminal viewing, will be quite another matter. If you think you've been through it all in home terminals previously...stick around. **You ain't seen nothing yet!**

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PROGRAMMING



**COOP'S SATELLITE DIGEST** (Programming Section) is published monthly by West Indies Video, Ltd. a Turks & Caicos Corporation with business offices located at Grace Bay, Providenciales, Turks & Caicos, B.W.I. Mail to CSD, advertising inquiries and subscriptions should be addressed to CSD, P. O. Box G, Arcadia, OK 73007; a mail forwarding point. CSD maintains no office in the United States of America although assistance relative to CSD advertising and subscriptions is available through the offices of Satellite Television Technology at (405)396-2574. STT has no legal affiliation with West Indies Video, Ltd. Subscription rates to CSD are \$50 per year in the US, Canada and Mexico; \$75 elsewhere. Entire contents Copyright 1981 by West Indies Video, Ltd.; Robert B., Susan T., Kevin P., and Tasha A. Cooper.

## SPTS '81 DC A STUDY IN INDUSTRY GROWTH

### OVER THE TOP

They came from Tokyo and Melbourne; Medellin and Kingston. From Alaska and California; Maine and Arizona. They came some 1200 strong to spend the Easter weekend in the nation's capitol soaking up EIRPs and dBw. They came to wander the aisles of the largest single concentration of low cost satellite TV hardware in the history of the world; some 80 exhibit booths in all. They came to participate in the "gathering of the clan," to talk with the Robert Colemans and the David Brouchs and to sample more than 30 hours of

past SPTS/SBOC events through the in-house television distribution system. They arrived fresh and full of expectations. They left tired and filled with new knowledge.

**Was SPTS Washington a success or a bust?** A great deal was against it going in. There was short notice as to the dates and location in advance. The location was magnificent but expensive. The dates were unavoidable of course; we did everything we could to find a suitable location and set the dates in the DC area and finally had to settle for the holiday weekend. Easter is a family time; this year, for the first time in several decades, the Jewish Passover also fell on the same weekend.

SPTS was designed to provide an on-going update on the technology changes rampant in our field and to blend with that technology the newest creation on the television frontier; low power TV (LPTV). There were 'super-stars' on hand from the Washington "scene"; Ralph Nader addressed the gathering and said the participants were part of a new visionary group of pioneers who would free America from the bonds of three channel network television. Congressman Charles Rose, an influential member of the House who drove the effort to put C-SPAN on the air, stated it was his personal opinion that any and all (!) satellite signals, received in the home by a private viewer, were beyond any system of charges. He indicated that he was planning the installation of his own private terminal in his North Carolina home and he didn't plan to pay anyone...for anything. FCC Commissioner James Quello said his agency maintains an open mind about the development of at home satellite terminals and invited SPACE and the industry to



**THREE FEEDS** - Downlink's 12 foot spherical poolside had three separate feeds 'playing' on a variety of bird sources.



**BOLT IT TOGETHER** - sectionalized antennas continue to be the order of the day, even for 'relatively small' 10 and 12 foot apertures.

educate the FCC to our industry's points of view.

In the low power TV area a bombshell had landed on the group just days before the SPTS '81 DC gathering; the FCC shut down virtually all new applications for LPTV, having logged in more than 5,000 applications for new stations and admitting the agency was so hopelessly covered up by applicants that they were forced to shut off the flood. We learned there was at least one area where the Commission would continue to accept applications however; if the new LPTV service will go into a region where there is no regular TV service (i.e. broadcast TV rather than translator or cable) or if there is no more than a single station available...the Commission will continue to accept new applications while the temporary "freeze" is on.

The LPTV enthusiasts heard BT's Ike Blonder say that even if they had no plans to really build an LPTV outlet, they should immediately file for as many as they could since **"the Commission will allow you to trade (as in sell off) such licenses after they are granted...and, if you wait, all of the possible good channels will be gone"**. They heard LPTV pioneer Parry Teasdale who operated an extra-legal (i.e. unlicensed) LPTV outlet in an upstate area of New York state for several years say that **"local involvement, getting local people on TV regularly, is the key to success of an LPTV outlet"**. And they heard Sruki Switzer, TV and CATV guru from Canada suggest that **"LPTV plus satellite services can and will change the direction of communications in North America"**. It was ex-FCC staffer Michael Couzens

(who appeared while still with the FCC at SOBC '80 Houston) who provided the greatest insight into the new community service and business opportunity. **"Low power TV is an idea, a concept, who's time has come"** said Couzens **"and the opportunity to be a television broadcaster is now"**.

SPACE had been in tight security negotiations for months prior to the Washington gathering hoping to be able to announce formally a break through at the gathering. After jumping upon the corporate bones of Westinghouse, Tele-Prompter and Showtime (see **CSD** for March and May 1981) SPACE had been successful in bringing SHOWTIME to the bargaining table. Concerned that a hitch might develop, because of SPACE opposition, in the purchase by Westinghouse of TelePrompter (and the latter's 50% interest in SHOWTIME), the giant firms decided to enter into negotiations with SPACE to see if something might be worked out for the legal licensing of (1) stand alone apartment, condominium and motel systems being sold by SPACE member dealers and distributors, and, (2) private (at home) terminals from the SPACE membership. The deal was **close**, subject to the inevitable final juxtapositioning of attorneys on both sides, as SPTS '81 Washington convened. But it missed the timing by a tad and hung in limbo without formal acceptance by the two sides as the group met. Still, the progress made by SPACE's Rick Brown and the Board was common "aisle talk" at SPTS and there was a feeling of a major break through just around the corner.

**On the darker side** SPACE Counsel Brown shared with



**WELCOME TO DC!** Susan Cooper opens the festivities while Coop and Tay Howard ponder their own remarks to follow.

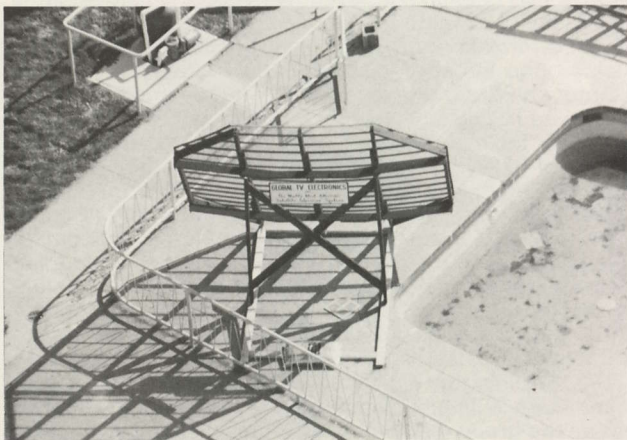
Board Members his insider's information concerning several pieces of legislation being readied for the hill hopper. One, with the blessing if not the actual backing of HBO, intends to make it some type of federal crime to tune into any HBO programming (whether delivered by cable, MDS, STV or satellite) without the written contract authority of the firm. On that possibility Congressman Charles Rose told the excited audience **"Nobody is going to come into my home and monitor what I watch!"** Rose called SPACE's Brown **"a boy scout"** because of the official and now respected position of SPACE that private terminal viewers **"wish to pay for the services"**. If anyone other than an influential Congressman had stood on the podium and said what he said, the zealous remarks of Congressman Rose would have gone unnoticed. Because **he** did say it, loudly and clearly and because he added **"I believe you will find there is a majority of the Congress who would agree with my position"** the several year old rift between those who feel that the industry can **only grow** if there is a legal foundation for paid-for services, and those who feel that Congressman Rose is correct, once again opened up. Neither Brown nor SPACE President Taylor Howard seemed concerned with the re-opened chasism however. As Howard later said **"It cannot hurt us to have some members of Congress taking that viewpoint; it will perhaps make it easier for us to arrive at a fair and**



**YOU SAW WHAT ON GHORIZONT?** Ralph Nader (right) is introduced to the Saturday morning audience by SPACE President Taylor Howard.

**equitable piece of legislation this session to have people inside of Congress espousing the strong 'if it rains on my head it is mine' point of view'.**

If the legal position of the industry, as it may apply to the two pay-cable-program giants HBO and SHOWTIME, was not entirely clear at SPTS '81 DC, the technical equipment advances were crystal clear. The day of the two-piece receiver is now here. DEXCEL dropped a \$1995 (retail) bomb-shell (see **Coop's Comment on Programming**, this issue). Not only had the California firm married a 120 degree K LNA to a downconverter and placed the entire assembly at the feed of the antenna, they also had on display pre-production versions of the whole inside-of-the-house demodulator package as well. The gear was probably the most impressive 'looking' hardware on display; with the simple but elegant look that one finds in Japanese high dollar component stereo system hardware. Two-piece units were all over the four exhibit rooms and 80 booths. Some are double conversion in design (ICM, Telecom Industries) but most were single conversion image-reject (or "imageless") designs. Several suppliers who had not foreseen the rush to two piece receiver units were quick on their feet and pointing out to interested buyers that "our downconversion stage can be 'simply' mounted in an outdoor enclosure". The advantages to two-piecing are well argued.



**LOWEST COST** - Global Electronics under \$1800 total package included this all wood construction spherical.



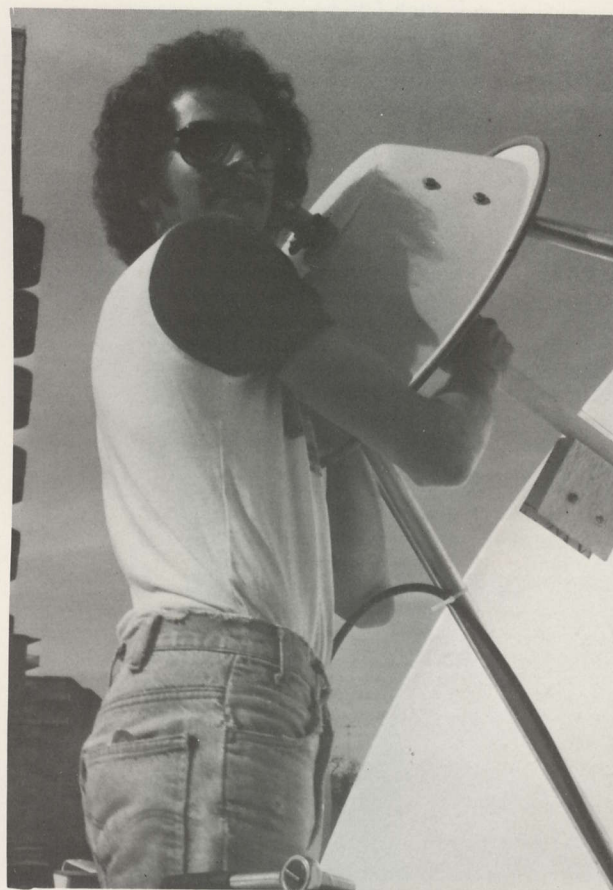
**SPHERICAL CONSTRUCTION** - Downlink spherical during assembly 'poolside' at the Shoreham.



**PROOF OF THE PUDDING** - after all of the work time for a break and the opportunity to observe the service. Most antennas were up and running by late Thursday afternoon.

One piecing (LNA plus full receiver at the antenna; or the whole receiver inside) has been with us since 1979. Everything **at the antenna** (only remodulated RF or baseband audio and video comes in the 'down line') was first conceived and built in prototype form by Robert Coleman in 1979. However the state of component technology at that time made it not suitable for mass production. So **the other** 'one piece' system evolved; the full receiver inside, ala the more expensive CATV type receivers. DEXCEL, with their in-house LNA technology, may have been the first to package it into a suitable unit but KLM was not far behind, showing their own LNA plus downconverter (in a weatherproof antenna mounting container) at Washington. ICM had production samples of their **dual conversion** package outdoor system on hand as well.

By getting the downconversion stages outdoors the 'big cable' problem is eliminated. If you reduce the output frequency at the antenna unit to say 70 MHz (the common IF for most receivers) then low cost RG-59/U or RG-11/U coaxial cables can run indoors to the balance of the receiver; the demodulator. Saving a few hundred dollars in system cost, by eliminating the expensive and often hard to work with 1/2" or larger cable, is an admirable feat of course. From the receiver manufacturer's point of view there are other reasons to go this way. If he can marry the LNA plus receiver together and provide the dealer/distributor with a single source **package** he has a larger share of the business. With LNA prices continuing to drop (you could buy 120 degree units for approximately \$450 in quantity at the show) a firm such as DEXCEL is quick to realize that its dollar share of the typical

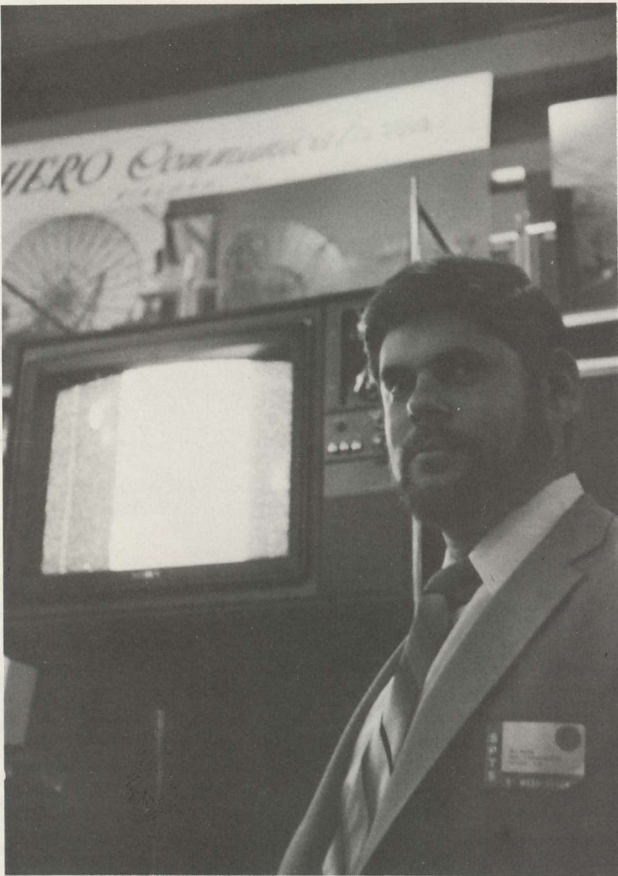


**TIGHTEN IT DOWN** - completing a feed installation in DC the exhibitor prepares to button it up.

installation was heading down rapidly.

**Single conversion arguments permeated the show.** In the main antenna display area interference between antenna systems was bordering on dreadful during most of the show. For at least one full day someone's single conversion receiver package sat parked on transponder 8 or so and tore up virtually everyone else's reception on WTBS on F1. We spent an hour snooping around and turning off one receiver at a time trying to locate the offender; with no luck. Talk surfaced about creating, through SPACE or by some other forum, an 'industry seal of good practice'. The concept is that a steering committee, put together by SPACE, would establish some hard engineering guidelines for what amounts of LO "radiation" might be acceptable, under what conditions and how. All receiver manufacturers would be asked to **voluntarily certify** that their equipment met or exceeded those specifications. And if they did not...well, the word would get around. Naturally not all receiver designers were wildly enthusiastic about the proposal and although it got off to a rapid start at the SPACE Board meeting on Saturday the 18th, by Sunday the 19th it had few active supporters left. The simple truth is that if the LO radiation found in single conversion receivers is reduced to 'harmless levels' many of the existing receiver designs probably could not comply; **no matter what** they did to change their designs. The realism that such a move might force a big division in the industry (and a softening of support for SPACE) became a political football at SPTS and the matter quietly moved to the back burner.

One point that did surface was the explosion of the 'Part 15' myth. Most people assumed that under present FCC Rules and Regulations receivers operating in this service were probably in violation of radiation limits. Subject of course to



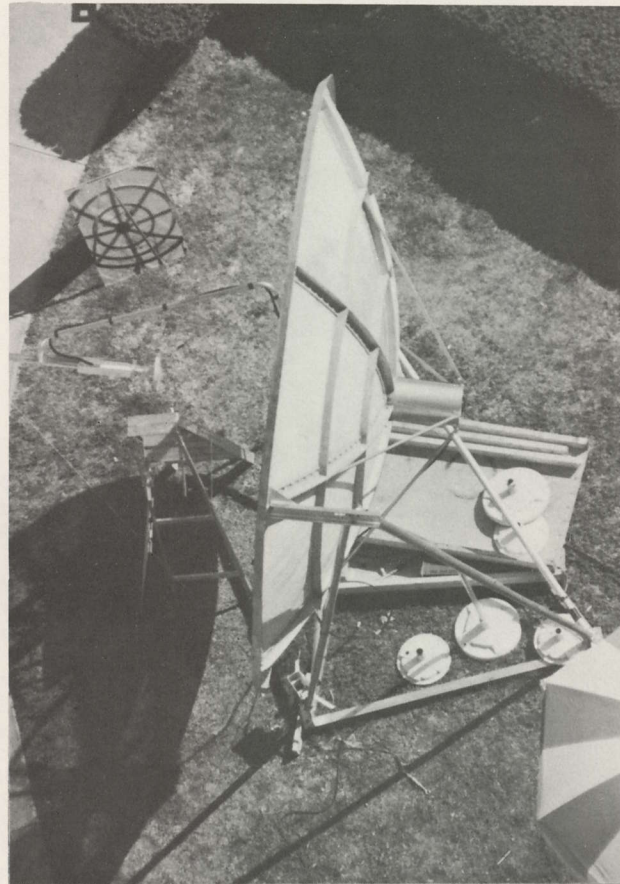
**BEHAR AND RUSSIA** - no stranger to tuning in Russian transmissions, Hero's Bob Behar shows off the Ghorizont test pattern late on Saturday afternoon.

an FCC official making his own clarification of the rules, an intensive search of FCC regulations suggests that at the moment at least there is nothing on the books which would apply to the 'uniqueness' of the TVRO receiver LO radiation situation. Bottom line? Nobody is violating anything for now, it **appears**, except perhaps good engineering practice.

The antenna arrays on display represented just about every possible variation of dish design concepts plus the usual sampling of Sphericals. Fiberglass is (by actual count) the most popular 'reflector surface suspension medium' but there are still some creative people working in bare metal. HERO Communications unveiled a new 5 meter super light weight package with motor drive polar mounting. Comm-Plus chose SPTS to unwrap a new 12 foot super light weight all metal parabolic with uncommonly good engineering. During the seminar an attendee from New York City posted a sign on a bulletin board:

**\$100 REWARD  
TO THE FIRST EXHIBITOR TO  
DISPLAY RUSSIAN GHORIZONT  
RECEPTION!**

With the gauntlet down Hero's Bob Behar cranked his motor driven five meter off of FI at 135 degrees west. Swinging east it had to look dead through a two story brick and mortar building, a series of 40 foot trees and most of the tall buildings in downtown DC. As the big dish came to a rest at 14 degrees west **there was Ghorizont** displaying the famous Russian test pattern. Word spread and a crowd crammed into the booth to see what Russian TV looked like. Behar had arranged,



**COMM-PLUS 12 foot mesh surfaced dish got high marks for good design and quick installation. It also was one of two antennas to locate the Russian Ghorizont bird.**

using vertical interval switchers, a line up of six different commercial receivers in his booth and the attendees could directly compare the full range of receivers on not only the Russian signal but on the more common US and Canadian signals as well. We'll have more to say about one-on-one comparisons shortly.

If the **HERO reception** of Ghorizont was mildly impressive, the subsequent reception of the same Russian signal on the **Comm-Plus 12 footer** was mind boggling. If you stood at the antenna site and looked at where the Canadian antenna was pointed you had to come to the conclusion that the antenna was **completely blocked** on the Russian heading. Parts of the Shoreham Hotel were less than 20 feet away and dead in line with the Russian bird. Yet there it was, on the Comm-Plus Teknimat receiver cranking out a mid-18th century Russian soap opera for most of the Sunday afternoon. Comm-Plus didn't collect the \$100 "finder's fee" since they were second to find Ghorizont; but they got our vote for making the impossible happen.

Why would someone offer \$100 for Ghorizont reception? Ken Schaffer did it. "I came here to learn how I would utilize this technology" he commented. "After a day I knew that in my audio business in New York City I could get a lot of mileage out of satellite TV and if I could demonstrate Russian reception in downtown New York ...well, that would be good for me". We last saw Kenny late Sunday trying to talk a Hertz agent into renting him a car so that he could haul a trailer mounted antenna he found in stock at an exhibitor's booth back to New York City. "I know I am crazy - there is no place to park it on West 58th Avenue; it will be defenseless and after sitting out one

night it will have so much graffiti on it that I won't be able to see the white surface anymore. But I'm one of you now. I want it. It is just that simple." We hope Kenny made it!

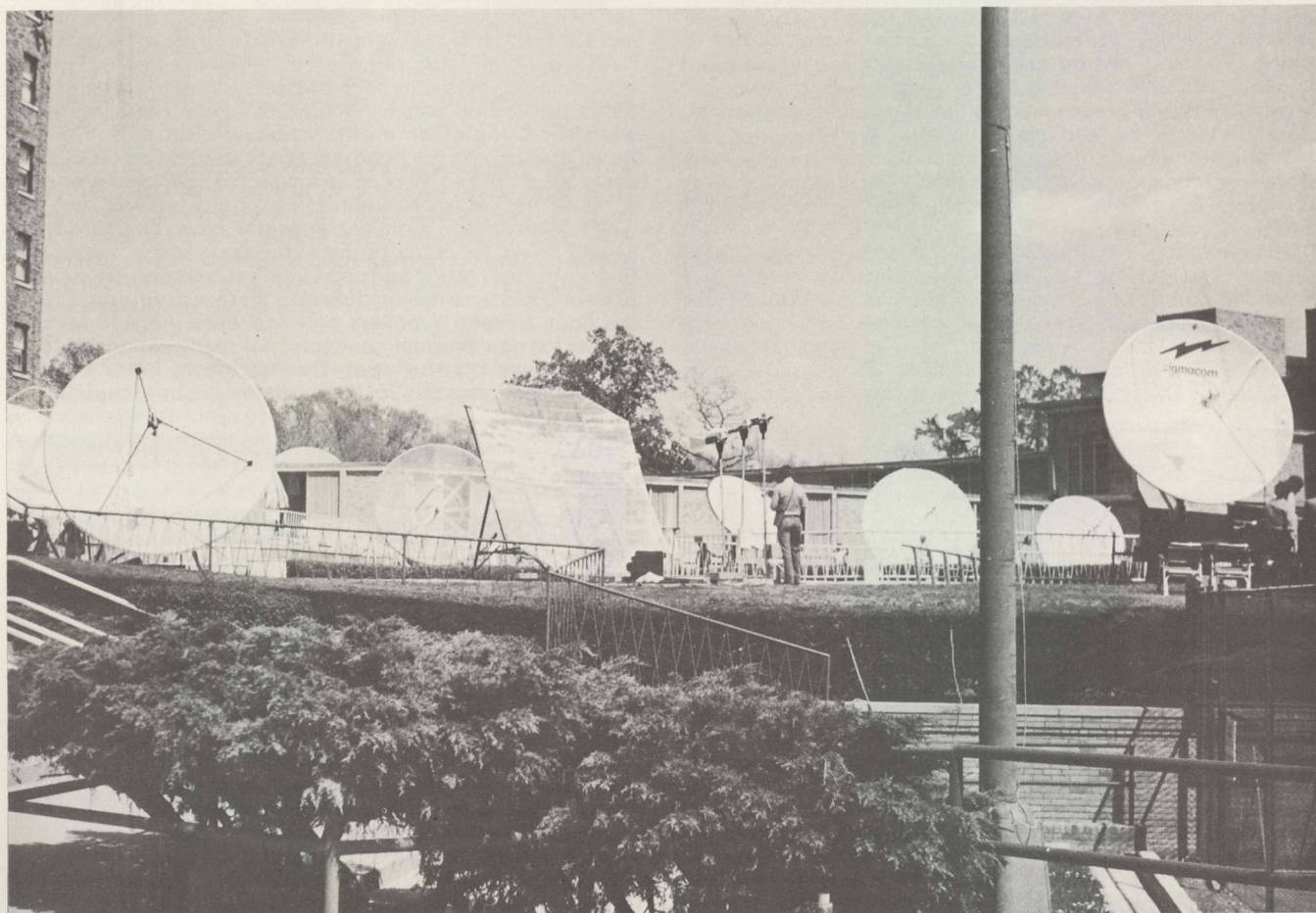
Antenna quality came up for a lot of discussion. Nelson Ethier, author of STT's do-it-yourself parabolic antenna manual noted "I cannot believe some of the poor workmanship here". Nelson may be a purist but he had a point. Some people seemed to have lost sight of the close tolerances required to get proper dish gain at 4 GHz. **"If you can stand on one side of a dish and sight across the surface...and the far side does not align with the side near you, the dish is simply not going to give you anything approaching theoretical gain"** added Canadian Nelson.

Concerned that all antennas of similar 'size' are not equal, and anxious to create a system to separate the 'wheat from the chaff' several exhibitors approached us regarding staging an **"antenna shoot out"** at the forthcoming **SPTS '81 Omaha**. One fiberglass dish antenna manufacturer was the first to do so. **"Look"** he said **"aren't we going to have a ten acre parking lot with no obstructions in Omaha in August?"** We agreed that we were. **"OK then...how about carefully establishing some measurement criteria and then let us do antenna to antenna to antenna testing, measuring carrier to noise with a power meter and using the same LNA and receiver on each antenna?"** Jeff's concept is that by selecting a transponder with color bars and then doing measurements of the antenna gains only (the pattern being clearly beyond the ability of such a test exercise) swapping the LNA and receiver from antenna to an-

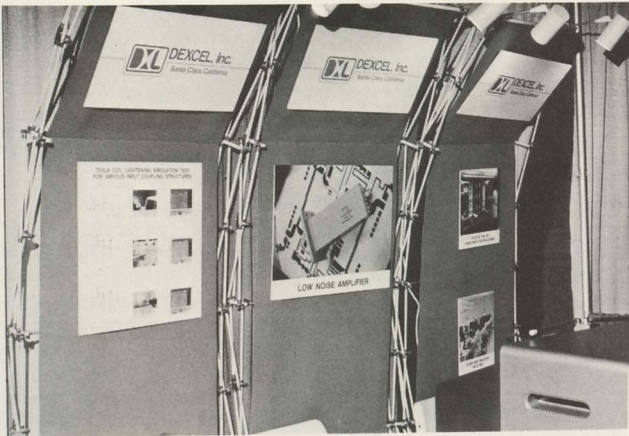
tenna (to keep things equal) the antenna manufacturers would be able to do real world side by side testing. We thought nobody would go along with Jeff and said we'd check into it. We managed to talk with James Gowen of ADM, Bob Behar of Hero and Daniel Bernesi plus Chris Schultheiss of Comm-Plus before we left Washington. Surprise; **all four agreed** it was a good idea and said they would participate!

So at least for now it looks like a 'voluntary' antenna shoot out in Omaha is likely to be an important part of the event. That may have been the easy part; getting a representative number of antenna manufacturers to agree to do it. The really hard part will be to establish the technical guidelines for the shoot out. We talked it over with Taylor Howard and came to the conclusion that even if we set up a reference antenna that provides full time monitoring of the chosen satellite transponder signal while the tests and switching from antenna to antenna are going on (having a reference is mandatory!) we were probably going to have something less than totally conclusive results. None the less we will be giving it the old college try and if you ever wanted to see just what it takes to get maximum gain out of an antenna, and which antennas do it best, Omaha is for you in mid August!

**Once that hurdle seemed over** (at least the decision part) the next suggestion to surface was that the same type of shoot out test be done with TVRO receivers. This one got a lot of interest but frankly the problems associated with this may be beyond the 'field site' capabilities in Omaha or anyplace else. While it would be a fairly simple matter to use a pair of antennas (one reference for monitoring and the other for



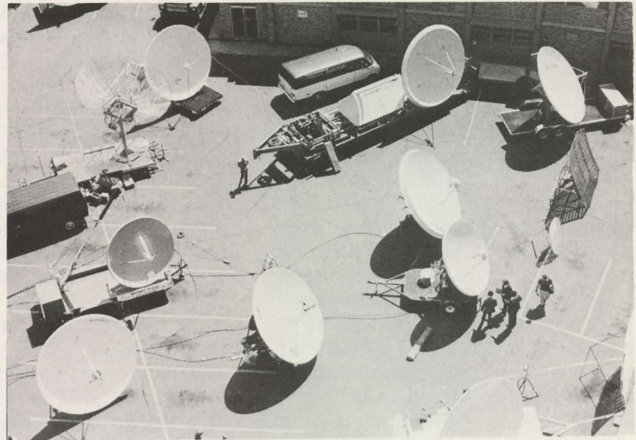
**JUST ABOVE THE HORIZON** - 'Poolside' antennas had a shot at FI...barely. Remember these angles when we gather in Omaha!



**DEXCEL TECHNOLOGY** - from their first entry into LNAs for the private terminal market DEXCEL has stuck with a high technology message. Now with a complete receiver plus LNA package they appear to have struck pay dirt.

receiver testing) and set up power meter carrier to noise test measurements, keeping everything equal is much more difficult with receivers than with antennas. Some receivers must have lots of LNA gain out front (and they admit it) while others can't take much LNA gain in front. As soon as you start swapping LNAs around to accommodate the various receiver requirements you have just lost your receiver to receiver reference ability. Furthermore the power meter carrier to noise tests may not be as important as the old fashioned 'eyeball' subjective testing. Meter readings mean a lot but 'eyeball pleasing' means more in the end. Some receivers do poorly in the former and fine in the latter. We are working on this one but unless somebody can come up with some hard, work-in-every situation testing procedures that the receiver designers will accept, this one may be too ambitious even for SPTS.

That satellite TV is becoming a household was never clearer. A surprising number of attendees came from the 'financial community'. Periodicals such as the **Wall Street Journal**, **Business Week** et al were on hand and very interested in what they saw. Only a few seemed concerned with the 'pirate' label some still hang on us; most were intrigued by the promise of the new technology and what it



**LOTS OF ROOM?** - From above, the cramped quarters of the primary antenna lot looks deceptively roomy. Actually, with low FI look angles it took a lot of cooperation to keep front antennas from blocking those to the rear.

might mean for America in the late 80's decade. Terry Easton who is putting the finishing touches on a book for Playboy Books, Inc. (**The Home Satellite TV Book; How To Put The World In Your Backyard**) announced his book would be on thousands of Playboy affiliated newsstands by late fall. Financial analysts with big dollar sign numbers in mind were sprinkled throughout the Seminar. Rumors of new public stock offerings, in the \$3 to \$10 million range to finance new TVRO manufacturing firms were frequently heard. The announcement that Channel Master, Blonder Tongue and Jerrold would be supplying TVRO reception terminal hardware (see **Coop's Comment**, this issue) fell on attentive ears. As we predicted in our February and March issues of **CSD**, the cat is out of the bag. We can no longer hide our industry under a bushel basket or an over turned surplus ten foot dish.

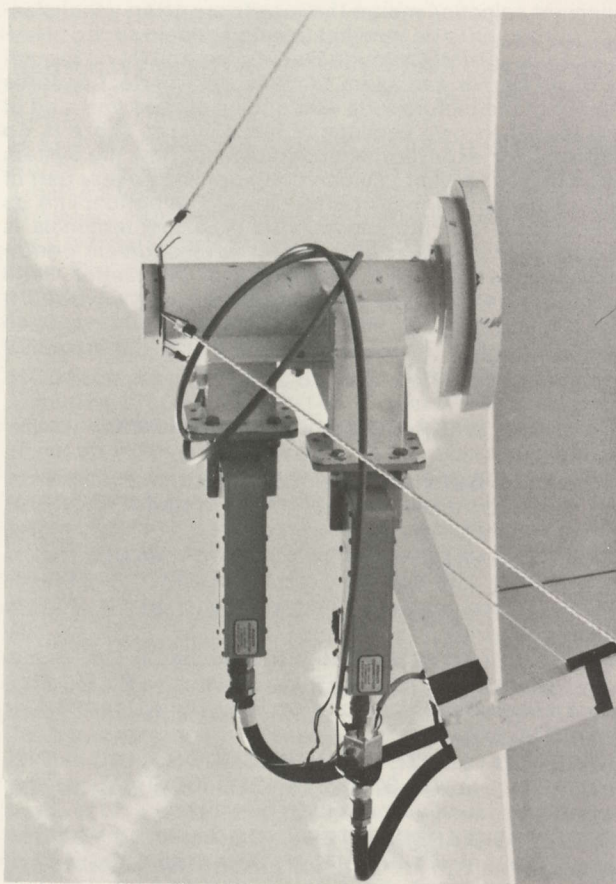
The Washington Seminar may not have been a 'direct selling show' for many of the suppliers. Several noted that they had lots of traffic and good interest but only one boasted of having written a million dollars or more in orders directly on the floor. Several suppliers on hand were there to test the waters for new product concepts; not really expecting to do big business **on the spot**. One of these, Indra Satellite Communications, Inc. of Scottsdale, Arizona brought an



**YOUR STANDARD BATHTUB SHOT** - sooner or later somebody ends up inside a dish trying to get the panels to align. It is part of the ritual!



**ANTENNA CONTROLLER** - Comtech Antenna Corp's dish control system offers six pre-programmed stops plus a continuous sweep through the orbit belt.



**DUAL POLE** - for those who have never seen how two separate LNAs are fed out of a single feed, here it is. While most private terminal installations continue to 'rotate' the feed and single LNA, the more elaborate installations and the semi-commercial installations are opting for twin LNAs fed by the orth-coupler feed and two or more separate receivers.

interesting package to Washington, Indra makes receivers; sort of. But they only intend to sell to OEM's; that is, to people who will take the Indra designed and manufactured 'modules' and then do the final packaging into a full receiver. Indra in effect does the R&D design work for a would-be receiver supplier and ships out the necessary production modules tested and ready for the "OEM" to package in whatever configuration he chooses. The receiver design is two-part, single conversion with an "unusual" IF of 150 MHz (rather than the standard 70 MHz). This says the downline cable can be low cost cable such as RG-59/U. The "OEM" customer gets into the receiver business by setting up a 'low technology' packaging assembly line and concentrating his efforts on marketing. The gear looked like high quality stuff and their concept may well have merit.

The mass merchandising concept for TVRO hardware seems to be picking up steam as well. At the moment there are three leading firms in the field; each has unique approach to the way they are doing things so there is probably only limited competition head to head in this segment of the industry right now. **H&R Communications**, a veteran at SPTS/SBOC events after John and Virgil attended the first SPTS in 1979 and went home with the one-of-a-kind John Kinik assemble-it-yourself dish, used a full exhibit suite to show off their broad line of antennas, receivers and their mass merchandised LNA products. **Downlink** took four ex-

# The ICM TV-4400 Satellite Television Receiver System

- New Design
- Improved Selectivity
- Built-in Bandpass Filter
- Built-in D.C. Block

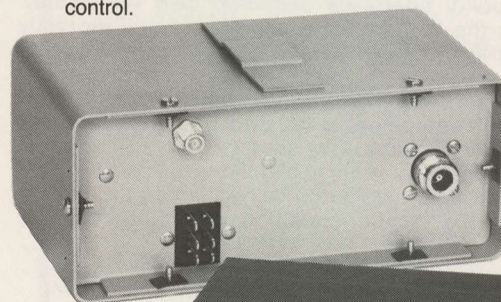
The ICM TV-4400 two-unit design offers advanced receiving techniques that improves satellite TV reception. The "system" consists of two units. The smaller of the two units is the RF downconverter which is enclosed in a environmental protective box (3' x 4' x 7'). The dual conversion RF downconverter is intended to be mounted at the antenna site as closely as possible to the LNA. The advantage . . . cable losses at the high frequency are negligible.

The baseband receiver unit (3½" x 8" x 8") has 6.2 or 6.8 MHz audio selector switch, channel step tuning selector, fine tuning, power switch, all on front panel.

Features include: Automatic frequency control, automatic gain control, standard video output, subcarrier output for future accessories, wideband phase lock loop demodulator, internal selectable video polarity, internal audio and video controls, provisions for RF modulator. Receiver is equipped with a standard jack for optional remote control.

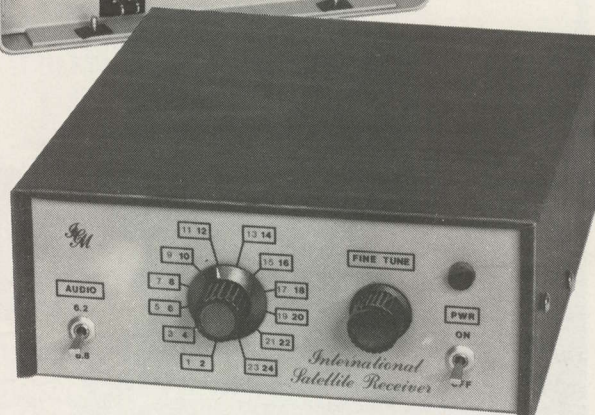
**\$1,395.00**

Quantity Discounts  
Available

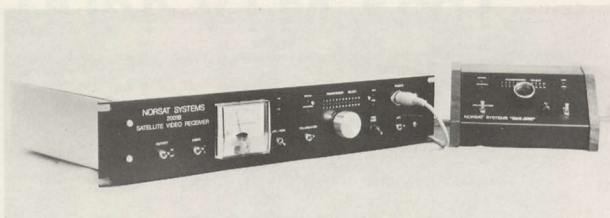


**OPTIONS:**  
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**NORSAT SYSTEMS - a Canadian supplier with two good operating dual conversion receivers displayed for the first time at SPTS '81 DC.**

hibit booths to display their rapidly growing line of products designed to put a dealer in the satellite TV business for a minimum of investment. **National Microtech** swallowed up six exhibit booths to explain their unique concept of offering dealers not only a wide variety of hardware but a high level national marketing program and 'mobile terminal downlink rental' system. All three of these firms have sprung up from the ground to service the growing industry and while new entrants such as Channel Master enter with a built in network of potential dealers these three probably have a good enough head start that they will not feel the emergence of new national selling programs.

In the good news department Bob Luly's umbrella antenna is now being shipped and for those who have been waiting (perhaps not patiently!), portable, lightweight field demonstrations can now proceed. Global TV Electronics showed off a complete system that can wholesale for around \$1800 or so (less in quantity); and that includes the LNA, receiver and their own low cost Spherical antenna totally constructed from wooden pieces (the reflector is metallic of course). Lindsay showed off a very imaginative 8.5 foot antenna that got high marks from critical antenna folks and based upon performance it looked like a ten footer or larger to most of us. Mac/Line displayed a fiberglass antenna that many felt was the highest quality fiberglass sectional dish on display. Whether it was the best or not is a moot point; it certainly looks like this particular new firm is going to offer a quality product.

If there is a single overall view of the industry in mid-1981, it is this. No, not all equipment is created equal. However, of greater importance perhaps is the short cuts which many new entrants into the industry seem to be following when they set out to make their first installation or two. When the combination of novice (i.e. inexperienced) installer and improper



**WILL IT FLY? Coop with Nelson Ethier (author of STT's Nelson Parabolic Manual) 'on camera' during the morning 'Today At SPTS' TV program sent to attendees daily at 8 AM.**

equipment selection merge the results are often unsatisfactory. It continues to be true that talented people such as Hayden McCullough (McCullough Electronics) and David Brough and David Barker can seem to make near perfect pictures jump out of the picture tube with a hank of rope and a bit of metal plus their own versions of black magic. **There is no substitute for experience**, understanding how the system really works, and what you can do to optimize every part of every installation for peak performance. The bottom line, as has been true from the beginnings of low cost terminals, is that you cannot take shortcuts and have optimum performance nor can you trust to luck. With each installation made there must be at least one knowledgeable person involved. It is not a difficult nor impossible task to learn...but there is no substitute for that knowledge. **We are not the home TV antenna business...yet.**

#### THE WASHINGTON DC EXHIBITORS

**AVCOM OF VIRGINIA, INC.** - 500 Research Road, Richmond, VA 23235 (804-794-2500). Total systems. Andy Hatfield, Pat Hatfield.

**ANTENNA DEVELOPMENT & MANUFACTURING, INC.** - Hwy. 67 South, P. O. Box 1178, Poplar Bluff, MO 63901 (314-785-5988). Total systems. James Gowen, Linda Gowen, David Shumate.

**ADVANCED ELECTRONICS** - 5079 Arville St., Las Vegas, NV 89118 (800-634-6047). Total systems. Jeff Stouffer, Howard Wilson, Ron Runswick, Pam Bear, Doug Dehnert, Kim Dehnert, Dave Shumate.

**BIRDVIEW SATELLITE COMMUNICATIONS, INC.** - P. O. Box 963, Chanute, KS 66720 (316-431-0400). Total systems. Charles Ross, Gunilla Ross, Robert Owens.

**BOB LULY AND ASSOCIATES** - P. O. Box 2311, San Bernardino, CA 92406 (714-888-7525). Antennas. Bob Luly.

**COMM/PLUS** - 3680 Cote Vertu, St. Laurent, Quebec Canada H4R-1P8 (514-337-7255). Antennas, LNAs, Receivers. C. J. Schultheiss, D. Bernesi, Gloria Bernesi, M. Jurgeniemb, D. Lester.

**COMSEARCH, INC.** - 7633 Leesburg Pike, Falls Church, VA 22043 (703-356-9470). LPTV engineering service. Jerry Schulman, Mike Morin, Harry Stemple.

**COMTECH ANTENNA CORP.** - 3100 Communications Road, St. Cloud, FL 32769 (305-892-6111). Total systems. George Cirutis, Glenn Higgins.

**COMTECH DATA CORPORATION** - 613 S. Rockford Drive, Tempe, AZ 85281 (602-968-2433). Receivers. Robert L. Miller, Bill Merkes, Jeannine Griffin.

**COSMIC TECHNOLOGY, INC.** - 3102 W. Lewis, Phoenix, AZ 85009 (602-245-1696). Total systems. Ralph Heller, Steve Crowe, Ray Carli.

**DEXCEL, INC.** - 2285C Martin Avenue, Santa Clara, CA 95050 (408-727-9833). LNAs, receivers. Art Kawai, Yozo Satoda.

**DEEP SPACE COMMUNICATIONS, INC.** - Route 1, Box 351A, Chancellor, AL 36316 (205-393-3211). Total systems. Dave Braswell, Frank Lambert, Margaret Braswell.

**DOWNLINK, DIV. OF B AND W ENTERPRISES, LTD.** - Park St., P. O. Box 33, Putnam, CT 06260 (203-928-3869). Total systems. Portus Barlow, Kathy Barlow, Sue Suick, Mark Kulaga, Pete Aucoin, Neil Cunningham, John Nowlan, Ted Baginet.

**EARTH STATIONS, INC.** - Hwy. 22, Barling, AR 72923 (501-452-4391). Total systems. A. B. Richmond, Stanley Johnson, Bob Beaty.

**EARTH TERMINALS** - Rochester ofc., P. O. Box 636, Fairport, NY 14450 (716-224-7457). Receivers. Clyde Washburn, James Jaeger, Stephen Corwin.

**GILLASPIE AND ASSOCIATES** - 177 Webster St., A455,

Monterey, CA 93940 (408-372-4771). Total systems. Norman Gillaspie, Lydia Gillaspie, Werner Vauken, Sherry Vauken.

**GLOBAL TV ELECTRONICS** - P. O. Box 219, Maitland, FL 32751 (305-628-2088). Total systems. Stephen Reed, John Reed, Scott McNealus.

**H AND R COMMUNICATIONS (STAR VIEW SYSTEMS)** - Route 3, Box 103G, Pocahontas, AR 72455 (800-643-0102). Total systems. John Hastings, Virgil Richardson, Randy Thompson, Ann Hastings, Mary L. Richardson, Larry Poe.

**HERO COMMUNICATIONS** - 1783 West 32nd Place, Hialeah, FL 33012 (305-887-3203). Total systems. Bob Behar.

**HOME SATELLITE TV, INC.** - Route 3, Box 135, Prince George, VA 23875 (804-733-5424). Total systems. John Wilson, Tom Price, Tim Rogers.

**HOOSIER ELECTRONICS, INC.** - P. O. Box 3300, Terre Haute, IN 47803 (812-238-1456). Total systems. Stephen M. Bland, Norma Bland, Jeff Vicars.

**ICON ELECTRONICS CO.** - 333 McPhillips St., Winnipeg, Manitoba, Canada R3E-2K9 (204-284-1703). Receivers. Willard Elliott, Brenda Hill.

**INDRA SATELLITE COMMUNICATIONS, INC.** - P. O. Box 1118, Scottsdale, AZ 85252 (602-994-3435). Receivers. Arun Pande, William K. Delaney, Ray Carli.

**KLM ELECTRONICS, INC.** - 17025 Laurel Road, Morgan Hill, CA 95037 (408-779-7363). Total systems. Peter J. Dalton, Nils N. Museaus, David Barker.

**LINDSAY SPECIALTY PRODUCTS LTD.** - 50 Mary Street West, Lindsay, Ontario, Canada K9V-4S7 (705-324-3709). Total systems. John Thomas, Koert Koster, Gord Chamberlain.

**MAC/LINE, INC.** - W. 3125 Seltice Blvd., Coeur d'Alene, Idaho 83814 (208-765-0909). Antennas, controls. Charles A. McDonald, Joseph H. Berube, Pat McDonald.

**MERRIMAC INDUSTRIES, INC.** - 41 Fairfield Place, West Caldwell, NJ 07006 (201-575-1300). Receivers, signal splitters, down converters. Dan Brodow, Alan Egger, Gene Niemiec.

**MICRODYNE** - 491 Oak Road, Ocala, FL 32672 (904-687-4633). Receivers, antennas. Dave Alvarez.

**MICROWAVE ASSOCIATES COMMUNICATIONS (M/A Com)** - 11211 Katy Freeway, Suite 215, Houston, TX 77079 (713-827-0303). Total systems. Tom Humphries, Ken McKee, Charles Stanton.

**MID-AMERICA VIDEO CORP.** - 324 W. Pershing Blvd., P. O. Box 511, North Little Rock, AR 72115 (501-753-3555). Total systems. Gene Mullenax, Hubert Smith, Tom Hunt, Don Greenwell.

**NATIONAL MICROTECH** - P. O. Box 417, Grenada, MS 38901 (800-647-6144). Total systems. Dave Fedric, Horton Townes, John Grantham, Billy Ferguson, Don Vance, Johnny Byford, Olivia Anthony, Carol Hendrix, Debra Ward, Kenny Weaver.

**NORSAT SYSTEMS** - Box 232, Surray, B.C., Canada V3T-4W8. Receivers. Rod Wheeler.

**SATFINDER SYSTEMS - Division of Rieco Electronics** - 6541 E. 40th St., Tulsa, OK 74145 (918-664-4466). Total systems. Dave MacZura, Anita MacZura, Larry James, Jim Mackerelle.

**SATELCO** - 5540 W. Pico Blvd., Los Angeles, CA 90019 (213-931-6274). Total systems. Sam Kleinman.

**SATELLITE ELECTRONIC SYSTEMS** - P. O. Box 14418, Hartford, CT 06114 (203-589-0473). LNAs. Rick Leers, Jayu Gates.

**SATELLITE TECHNOLOGY SERVICES, INC.** - 11684 Lilburn Park Road, St. Louis, MO 63141 (800-324-4058). Total systems. Jim Rothbarth, Don McClaughtin, Dave McClasky.

**SATELLITE TELEVISION TECHNOLOGY, INC.** - P. O.



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MICROWAVE ASSOCIATES VR-3XT  
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MERRIMAC INDUSTRIES SR-1  
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## LNAs AND ACCESSORIES

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Box G, Arcadia, OK 73007 (405-396-2574). TVRO, LPTV publications, manuals, charts. Susan Cooper, Gloria Schneringer.

**SATELLITE TV SERVICES, LTD.** - 4515 Willard Avenue #A, Chevy Chase, MD 20015 (301-652-5333). Total systems. Richard Wells, O. D. Page, John Thompson.

**SATELLITE VIDEO SYSTEMS** - P. O. Box 673, Cabot, AR 72023 (510-843-2186). Total systems. Bobby Kaylor, Barbara Kaylor, Winn Spurling, Joan Spurling.

**SAT SHARE, INC.** - 7676 Woodway, Suite 210, Houston, TX 77063 (713-789-5913). Total systems. Nelson Thibodeaux, Tom Halfare, E. C. Ming.

**SAT-TEC SYSTEMS, DIV. RAMSEY ELECTRONICS, INC.** - 2575 Baird Road, Penfield, NY 14526 (716-586-3950). Receivers. John Ramsey, Judi Ramsey, Mike Leo.

**SIGMACOM SYSTEMS, INC.** - 111 Industrial Drive, Whitby, Ontario, Canada L1N-5Z9 (416-666-1661). Total systems. Randy Zedic, Mike Taylor, Don Van Alstyne.

**S.P.A.C.E. (SOCIETY OF PRIVATE AND COMMERCIAL EARTH TERMINALS)** - 1920 N Street, N.W., Suite 510, Washington, D.C. 20036 (202-887-0608). Rick Brown and staff.

**SPACE COM INDUSTRIES** - P. O. Box 66, Cape Girardeau, MO 63701 (314-334-2011). Antennas. Ronnie L. Morgan, Dennis Allbright, Charles Perry.

**STAR VISION** - 2356 W. Oak Ridge Road, Orlando, FL 32809. Total systems. Dwight Brewster.

**S.T.V.N.** - 2328 Montgomery St., Silver Springs, MD 20910 (301-587-2215). Total systems. Chip Peake, Joseph Hopkins, Marion F. Peake.

**TELECOM INDUSTRIES CORP.** - 27 Bonaventura Drive, San Jose, CA 95134 (408-262-3100). Receivers. Jim Bertonis, Andy Gibbs, Vinny Finelli.

**VIDIARK ELECTRONICS** - P. O. Box 57, Salem, AR 72576 (501-895-3318). Total systems. H. D. McCullough, John McCullough, Dutch Walker.

**WATKINS-JOHNSON** - 3333 Hillview Avenue, Palo Alto, CA 94304 (415-493-4141). Voltage controlled oscillators. Val Jackson, Hutch Collier, Bob Smith.

**ZANDEX COMMUNICATIONS** - P. O. Box 2667, Zanesville, OH 43701 (800-848-0528). Total systems. Paul Fields, Guy Davis, Deborah Fields.

## SPTS '81 OMAHA WILL BE BACK TO BASICS

### BACK TO BASICS

In spite of the encouraging growth in the industry during the past two years there are 'danger signs' around that much of what the newer entrants into the field are doing is going to get them (and the industry) into a pile of difficulties in the months and years ahead. A not uncommon statement heard repeated

by attendees at SPTS '81 Washington this past April went something like this:

**"Yes, I am selling six TVRO terminals each month. It is a good business for me. No, I don't have any idea how a TVRO terminal works and what's more I don't want to know..."**

As "easy" as people such as Hayden McCullough make satellite TV reception "look" the truth is that there is nothing simple about getting peak or optimum performance from an installation. YES - many of the manufacturers of antenna systems have simplified the antenna portion of the system and the chances for error are greatly reduced from the early installations of perhaps two years ago. But this is still not the "home TV antenna business" and it is not likely to become "that simple" for many years to come.

The very first SPTS, held less than two years ago in Oklahoma City in July of 1979, was a very "basic" seminar. People who attended that SPTS came anxious to learn how you squeeze the last fraction of the dB of system gain out of the antenna, the transmission line, the LNA plus feed and the receiver. They went home filled with practical data and while in Oklahoma City at SPTS they had the opportunity to touch and feel and work with systems of that era. Subsequent SPTS events and the Houston SBOC event gradually got away from the basics and became more oriented towards the business end of selling terminals. The basics of system design, planning, and installation care and routine maintenance have become an almost "lost art" in less than two years.

**We feel that at least one SPTS event per year should zero in on the basics.** We feel that getting peak performance out of a system is not only needed information but very important data even if you feel that system design has become so simple and repeatable that they will work for you virtually everytime...straight out of the box.

**SPTS '81 Omaha, August 14-15 and 16** is our "back to basics" event for 1981. The location is ideal for this type of gathering. We will be gathering at the world's largest Holiday Inn (**Holiday Inn 72nd** located at 72nd and Grover in Omaha) with 504 sleeping rooms on premise. Additionally there are two other motels with a total capacity of another 500 rooms or so directly (walking distance at that) across the street from this Holiday Inn. The facility has a gigantic Conference Center for exhibits and more than a dozen 'smaller rooms' for gatherings or groups into the low hundreds. Best of all for the antenna portion of this business, we have a ten acre (!) paved parking lot, flat, not blocked by anything but Nebraska blue sky, directly adjacent to the Conference Center. This means plenty of room for antennas, relatively short feedline runs, and none of the blockage or low signal level or interference mess that we have had to put up with in Houston and Washington recently.

The program is being designed around the unique opportunities presented by the huge facility. For example:

- 1) **General sessions** - there will only be four all inclusive "general sessions" (i.e. with everyone attending). There will be one each on **Antenna Basics**, **LNA Basics**, and **Receiver Basics**. Each of these three sessions will be designed to teach you, in two hours of thoroughly prepared materials just how each of the three major segments of a TVRO installation work. You'll learn what is good and what is bad and how to avoid problems in each area. The fourth "general session" will be the SPTS gathering of SPACE.
- 2) **Built around** these "general sessions" will be an extensive series of in-depth smaller sessions located in smaller meeting rooms. In these smaller sessions you will be able to sit down with experts in a field (such as antennas) and **talk** about the practical problems associated with (say) antennas; or whatever. The "general sessions" will 'teach' while the specialized smaller sessions will be informal, hands-on, two-way participation.
- 3) **There will be a room dedicated** to each of the three

specialized sub-parts of the system; antennas, LNAs and receivers. Test equipment, displays (not commercial displays but operating test systems), and the working tools of each trade will be permanently left set up in each of the three dedicated rooms for the full three day seminar. Experts and other knowledgeable people in each of the three sub-part areas will man these specialized rooms on a schedule. You will know when you can go to a certain room and find a specific person there to discuss and answer your questions in that area of expertise.

4) **In the antenna area**, we are attempting to put together an antenna 'test range' program. Now we hesitate to call this an "antenna contest" or "antenna shoot-out" (as some already are doing) but in the final analysis that may be what it turns out to be. The concept is that those antenna suppliers who wish to subject their antennas to a testing procedure will have the opportunity to have tests run with their antenna/feed. We'll use the same LNA and receiver for each antenna tested and take other precautions to insure that apples and apples are being compared. This will be an on-going event starting early and running until the last antenna offered for test is checked out. Anyone who spends a few hours witnessing how these tests are conducted will learn more about squeezing the last milli-dB out of an antenna system than could be learned in months of text book reading.

Unlike recent SPTS/SBOC events there will **not** be a **single** (center) day with emphasis on the exhibits. We will be heavily involving many of the exhibitors in the teaching of the basics process and this will create a 'patch work quilt' of exhibit hours **spread** through **all three days**. We will also be using the in-house MATV system in a new and novel way, to allow you as an attendee to not only sample past SPTS and SBOC events but to also participate in direct two-way dialogue with session leaders even if you are back in your own motel room getting a little rest!

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**NOW** on the surface this might seem like a lot of fun but not a very good opportunity for business people to meet potential suppliers of equipment. Actually quite the opposite will be true. NO, there will not be any direct sessions aimed at getting you started in the business of selling TVROs. **BUT** - what there will be is a so complete and thorough treatment of how everything **really works** and how you **avoid** big and costly mistakes in the selection of equipment to sell and install that you will (as a present or potential entrant into the sale and servicing of equipment) be far better prepared to deal with your local problems.

**Rooms.** In spite of this being such a large facility, those 504 rooms are **not** going to hold everyone that will attend. The recent Washington SPTS, for example, ate up an average of 700 rooms for the two big nights and many many more people came from the 'local' DC area than will come from the local Omaha area. The exhibitors alone, with their staffs and participants, usually take upwards of 200 rooms. There is nothing wrong with your being "across the street" at one of the other two 'overflow' motels. **EXCEPT** - that if you are there you will **not** be able to participate in the Holiday Inn TV distribution service (we cannot get the service over to those two facilities). **YES** - this suggests that if you want to be a **total participant** that you get a move on and get your registration form in **today**. One appears in this issue in the center section just after the **T** portion of **CSD**. See you in Omaha in August!

## PROGRAMMING CORRESPONDENCE

### DEAR READERS -

I have just returned to Oklahoma via the Atlanta Electronic Distributors Show. This is one of those annual affairs where in this case the folks who distribute resistors, capacitors, transistors as well as items such as TV Antenna and amplifier lines gather to see what is new in their industry for the year and to share sales strategies. I was invited to speak to the distributors about the emergence of home or private satellite terminals. At the show I found perhaps 100 exhibits manned by sales and engineering people and there were some familiar faces in the group. Bob Behar's Hero Communications was on hand to try to talk distributors into becoming a part of the satellite TV revolution. In the Lindsay Electronics booth we saw one of the Comm-Plus Teknimat receivers. But the clear 'hit' of the show was Channel Master.

Elsewhere in this issue I report on the entry into this field of old line home antenna supplier CM. In Atlanta, at what they consider "our show", they clearly were after the interest and orders of distributors. I inspected their new ten foot four section fiberglass dish, their nifty four wheel trailer demo rigs, and their KLM built single conversion receiver which they have installed into a new non-metallic container for mounting at the antenna. CM is offering four packages; a 10 foot with either a 120 or a 100 degree LNA, and a 12 foot with the same LNA choice. The 'list pricing' on the ten foot, 120 package is

just under \$6,000 and the distributors will be working on a 15% margin. The dealers will in turn be working on a 25% margin. All of this says that the package leaves the CM facility in the \$4,000 region. The dealer in turn can be expected to charge a few thou to make the installation (i.e. the labor factor).

**I am guessing** (and I clearly label it as such) but it appears they may be able to be delivering around 250 to 300 of these per month by say August 1st. For now the receivers are coming directly out of KLM as assembled units but they are being given final testing and check out at CM before they end up in their containers.

**And again I am guessing**, but I would expect that by the time the sales for their packages reach the 700 level or so they will be looking seriously at starting up receiver assembly in their Taiwan plant. Someplace around the 1,000 receiver per month region, I suspect, is where building the electronics off shore starts to make dollar sense. I can see that happening within a year or less, but by the time you get to that kind of number other factors such as cranking out 1,000 10 and 12 foot dishes per month also begins to become a substantial 'challenge'.

I can report that the electronic distributors, in spite of their 15% 'share', were very excited about being able to offer a home package. Several I talked with said that they would form their own 'retail outlets' in their area(s) in addition to servicing dealers who now buy from them. One fellow from Indiana summed it up by noting "**This business has gotten kind of tiring in the past few years; we have lost the 'fun' of dealing with exciting products. Satellite TV brings it all back again and I am very excited about the prospects**".

CM has done several very interesting (even clever) things in putting together their marketing effort. Every sales rep and every distributor must go through a three day school at the CM facility in Oxford, NC. Every distributor must then go home and hold similar schools (using videotape and printed manuals) for his own personnel. In the three day school they spend the first day learning how the satellite system works, the second day learning how the CM package goes together and then on the third day each student is assigned the task of taking a trailer mounted demo rig, driving to a site where he has not previously been, and setting up and finding three birds within 40 minutes time. The record for this exercise is just under ten minutes. Several dozen males and one gal have 'soloed' to date and each who does so is awarded a handsome lapel pin that tells the world they passed the test and came through the course with flying colors.

CM's attitude or position regarding the legality of reception is straight forward. "**We are very careful to explain to our dealers and reps the three categories of signal services available**". CM believes that with persistence SPACE will be able to resolve the programming permission issue through negotiation. They are supporting SPACE in these efforts and carry no shame for making available to the American consumer a wide choice of high quality television.

Immediately after my talk in Atlanta Bob Fleming with the Conifer/Winegard group came up to tell me that Winegard now plans to offer to their dealers a package of antenna and receiver from Comtech in the very near future. Comtech of course has been selling both receivers and antennas in this field for some time now, through distributors such as H&R (receivers). Fleming also told me that his firm has a target date of 1 January for the coming year to introduce their own line of single channel TVRO receivers aimed at the semi-pro condo, apartment (etc.) marketplace. A frequency agile (tuneable) receiver will follow later in 1982.

My own gut reaction to what is happening is this. Anyone who can enter the industry with a **built-in network of dealers and distributors** has a leg up on the ultimate marketing strategy that is evolving. Dozens of distributors I talked with said that they have wanted to get into TVRO hardware for a year or more but felt uncomfortable with the 'newness' of our

existing suppliers. Between the uncertain legal status for some signals and the uncertain economic future of firms that are new to business, they did not feel the climate was right for them. Channel Master's entry has changed all of that. Based upon the reaction I saw in Atlanta I doubt CM will be able to supply even their own distributors with sufficient product this year. In fact I will be surprised if they can handle their own marketing network demand **until** they make the firm decision to take the receiver (and possibly LNA by then) offshore to Taiwan for manufacture. Some of their distributors will get hooked and then find they can't get as much product as they can sell. That will bring them, hooked, back to the existing suppliers in the industry to fill in their inventories. Adding perhaps a hundred new distributors to the industry, overnight, is going to cause some problems we will all have to adjust to.

CM has plenty of additional work to do on their package. The Az-El mount is a good one but sooner or later they are going to need a motor driven polar. They tell me that they don't think anyone has really made a good motor tracking polar mount yet and they are working on it. I think several of those now available work quite well but we can always use some new ideas since anything can be improved upon. Their selection of KLM receiver is understandable but the decision to stick it into a **fiberglass** container bothers me since single conversion LO radiation is not attenuated by a housing such as this. They say they are conducting engineering tests to pin down **where** the LO signal is present and what they will need to do to stop it. I have asked them to share with us the details of what their engineering measurements disclose since I happen to believe that once somebody really sets out to solve this particular problem the 'fixes' created will apply to virtually any receivers that follow the same design approach. Keeping 'secrets' in a competitive environment is necessary in most instances; but when it comes to allowing a problem such as this to continue those who find solutions need to share them since unresolved or only partially resolved this problem can kill us all.

**This is the year TVROs go public.** Channel Master has tapped a vein of interest in a very substantial portion of the American electronics industry. Others will be doing the same thing just as this publication reaches you at the summer "CES" gathering in Chicago. According to industry sources there are thousands of 'dealers' out there in the business. Through distributors and directly through shows such as CES, I predict 1981 will be remembered as the year many of these people discovered the golden vein hidden above the equator.

Coop

## BIRD OPERATIONAL NOTES

**HERO COMMUNICATIONS** has announced and is now shipping a 12 foot version of their aluminum frame/mesh surface TVRO antenna; available with or without motor track-

ing. Antenna was well received at Atlanta Electronic Distributor Show and will be seen at CES gathering in Chicago as well.

**CHANNEL MASTER** may have written as much as \$5,000,000 in orders for their new 10 and 12 foot packages at Atlanta EDS meeting; one instant reaction was pre-announcement by Winegard that it will be offering 10 foot Prodelin antenna, M/A COM LNA (120) and Comtech receiver around August 1st for its distributors.

**FCC APPROVED** the COMSAT proposal for DBS service. It will be final someplace someplace around the first of June after another round of comments. Under the approved plan COMSAT **may launch** an 'experimental' DBS service **prior** to the 1983 North American/South American "regional" conference on space allocations. The uplink frequency range is to be 17.3-17.8 GHz while the downlink range will be 12.2 to 12.7 GHz. **However** 'experimental service' seems very unlikely as even COMSAT admits they cannot launch a 'rush' bird prior to perhaps 1984.

**OTHER APPLICANTS** for DBS immediately surfaced. A new group called DBS CORP says it will ask for 32 (!) channels of service covering 1/2 of the US per bird. Some of those 32 channels will not be available in the full boresight region; limited to spot beam regional service. Unlike the COMSAT proposal, DBS says it will not charge for service but will rather charge \$500 to \$1000 per hour to programmers who wish to reach home viewers.

**YET THIRD** applicant for DBS to file is Hubbard Broadcasting. Hubbard owns chain of television stations. Novel plan calls for only a channel or two, using resources of local TV stations in top 50 markets to feed programs to birds.

**COMSAT** meanwhile still searching for single entity to 'joint venture' the service; recall that SEARS deal fell through last winter leaving COMSAT with a proposal and funds but no way to really implement huge anticipated earth portion of business (i.e. selling and installing and servicing terminals).

**CANCOM**, a Whitehorse, Yukon firm got Canadian government approval to create a new satellite delivered national TV package service via ANIK A-3 which will supply four Canadian TV Stations (i.e. super stations) and 5 FM radio signals for approximately \$4 per home per month. Service could start as soon as 1 September and will be distributed on ground in scrambled mode but probably delivered via satellite unscrambled. A-3 bird is serviceable at moment but Canadian reports indicate it requires extraordinary operator vigilance with some erratic habits.

**SCIENTIFIC ATLANTA** may be backing into semi-pro and residential marketplace; announcing a new Model 6650 video TVRO receiver which appears to be priced in the \$2100 region in fairly sizeable quantities.

**MERV GRIFFIN** show moving to satellite, WESTAR 3, under agreement with Robert Wold satellite transmission outfit. Service should begin in fall, will be in 1/2, full and one and a half hour formats. For MG affiliates not presently equipped with TVRO terminals, Microdyne will provide them through a deal with Wold.

**LATEST** word on when SATCOM 3R will fly suggests August at earliest. With delay in 3R **CSD** will hold off until at least August issue presenting comprehensive overview of how the launch of SATCOM 3R and SATCOM 4 will impact on the present line ups and EIRP contours for both birds.

**RCA** is adding a Miami, Florida uplink site with an 13 meter Harris antenna. The South Mountain (southern California) uplink is also getting a new 11 meter Harris dish.

**INTELSAT V** birds scheduled for launch; F1 (F2 went first) should go up by time you read this; F3 bird may go in August.

**COMSTAR** will begin handling, around end of October this fall, CBS and ABC network services on a per event basis with plans to expand schedule for a 'test period'. The CBS service will connect Hollywood facility with network headquarters in New York. NBC was to have begun using COMSTAR D2 this May 18th for regular network feeds to Chicago and Houston.

**EFFECTIVE** next January 2nd transponder 22 (Modern

Satellite Network) on F3-R will break down so that from noon to 1 PM MSN will program, 1 PM to 5 PM Hearst / ABC Video Services (HAVS) will program new woman's channel service. Hearst is in partnership with ABC on this one and will use resources of magazines such as **COSMOPOLITAN** to generate programming for women.

**IF YOU NEED** a 'big' motor driven antenna system S-A has announced a new 7 meter system that has 20 satellite memory positions and can move 100 degrees of arc in 60 seconds time...for \$39,000 (dish and drive and programmer).

**ARGENTINA** will join Brasil as a user of INTELSAT transponder space for the creation of a live, national TV network. However unlike Brasil which utilizes a half transponder format for video, the Argentine system will lease 1.5 transponders from Intelsat using one full transponder for television and for sub-carrier Argentine national radio. While some of the earth stations involved are expected to be installed by the end of this summer there is no hard word on **when** the use of the transponder may begin. With some of the dishes as small as 6 meters in size this suggests that the Argentine feed will, like the Brasil-Sat feed, be on a hemispheric pattern. Such a pattern would provide a 29dBw service throughout all of South America, parts of Central America, all of the Caribbean and the southeastern USA.

**TWENTY** million dollars reportedly is being raised to launch a satellite delivered Spanish language / Catholic church programming service.

**PARTIAL SPACE** victory has Showtime now agreeing to sell services to apartments, condos and other formerly taboo locations. Home Theatre Network now agreeing to sell service to individuals for \$45 a year; details from SPACE.

**TWO FOOT DISHES** designed to recover only very narrow band single channel audio communications service being readied for test marketing late this year by Commodity News Service. CNS provides commodity news and instant quotation services to more than 7,000 customers now nationwide. Using WESTAR transponder the new service being tested now at 7 locations uses a 'spread spectrum' approach similar to that employed by military communication systems. Information from 816-842-5021.

**JUNE 16** is expected launch date for Indian experimental geostationary satellite Apple. Bird is first for India, will operate in 4 GHz band.

**HOLIDAY INN** now operational at 170 locations and plans to expand to 250 by end of year. Use of their receive terminals for teleconferencing has been growing with more than 15 such events since mid 1980. Largest gathering so far totaled 5,000 realtors gathering at some 100 locations.

**BIGGEST DEAL** ever in satellite transponders; Group W (Westinghouse) agreed to purchase total of 10 transponders, five on **WESTAR 4** which will launch shortly after first of year, five more on **WESTAR 5** scheduled for launch near end of 1982. Both of the **WESTAR** birds will be 24 transponder, will replace **WESTAR 1** and 2. How will the ten transponders be utilized? "Largely for providing television programming to CATV systems and broadcasters" according to spokesman.

**CRUEL HOAX?** SPACE's Rick Brown wondered aloud in Houston whether the FCC's grant of LPTV activities really amounted to a 'cruel hoax' since each LPTV station would have to create or contract for its own programming and it seemed as if traditional (pay) program sources such as HBO, Showtime et al were reluctant to deal with the new industry. At SPTS '81 DC an answer came. A. Terrence Easton, Chairman of the Board for **National Entertainment Television, Inc. (NET)** announced his firm will rent transponder time / space and make available to LPTV outlets a day's program schedule consisting of adult education (for college credits) in the daytime, and premium movies at night. NET is actively soliciting affiliates. The pay part could of course be scrambled at the (local) option of the LPTV operator. NET is located at 559 Pacific Av., San Francisco, CA 94133 (415/474-4321).

**PERHAPS** overlooked in the rush to LPTV is the FCC's

allowance for VHF translators to utilize **separate** ten watt power amplifiers for different directional transmitting antenna systems. If you can serve four separate 'communities' or pockets of people from a site, you could in fact use **four separate ten watt output amplifiers** to send maximum power signal into **each** rather than having to split the original ten watt source into four component parts. That's a 6 dB improvement in each of the multiple-served directions.

**MYSTERY** of unlucky transponder 13 on FI is not a mystery. Transponder originally was used by Trinity Broadcasting for feed of KTBN 24 hour per day service. During 1979 the transponder developed erratic behavior and Trinity began dual feeding with COMSTAR D2 to maintain service. Then transponder appeared to quit altogether and Trinity disappeared from FI. By careful ground controlling transponder 13 has been brought back to life again but only with the apparent capability to operate for a portion of the day. Any regular use of the transponder is unlikely.

**REPORTS** that FI may be exhibiting minor ("but correctable") erratic control problems could be well founded. Numerous observers report loss of polarization integrity (indicating the bird occasionally tries to rotate on its own axis) for brief periods. **CSD** encourages those with measurement capabilities to 'log' time and date of observed abnormalities. Send along a full description of what you saw and when you saw it with particular care given to checking all of the transponders at the same time (to eliminate abnormalities only associated with a single transponder). We'll compile the results and publish them here as a guide to others.

**MAJOR** effort of SPACE in coming months will be crucial legislation planned by HBO and others to create federal penalties for unauthorized viewing of subscription (premium) programming. HBO continues to be reluctant to deal with any but cable and MDS operators and to feel that scrambling is **not** the 'proper' answer to protecting their product.

**CLANDESTINE** LPTV operations, unlicensed by FCC and generating local programming and/or directly tied to non-sanctioned satellite feeds are springing up in Rocky Mountain states. Most such operations are using 1 watt VHF "translators" fed by tape decks and/or low cost satellite receive terminals. One knowledgeable FCC source indicated the agency is aware of several operating "within one hours drive time from Denver's Stapleton airport".

**INTEREST** in bringing US TV to Caribbean and Central American regions mushrooming; numerous groups working on projects involving both US videotaped programs and satellite fed sports and news for perhaps a dozen countries/islands. Most of the efforts are being funded by US business people in concert with local 'native' partners.

**BERMUDA** private terminals are now subject to strict local zoning ordinances as government there getting nervous about growth of backyard terminals. Private use seems legal, even to government, so tack being tried to slow down interest is to force would be installers to go through complicated construction permit process identical to that required for new houses or commercial buildings.

**ON AGAIN / off again** government interest in the Bahamas towards regulating or even licensing private terminals. Private use, for single family, seems OK for now but plans to 'share' service through cable or over the air re-broadcasting getting thumbs down policy from Bahamian government.

**LIVELY** business taking place just south of US/Mexican border where terminals are being installed (fed by FI and by XEW service on W3) and connected to ten watt VHF translators. One VHF translator supplier notes "several dozen orders now in house" for units for that region.

**AVCOM** of Virginia may be first of single conversion receiver manufacturers to develop a 'cure' to LO signal getting back out of receiver input connector to LNA and antenna. Andy Hatfield's SPTS '81 DC booth had customized isolator package that allowed multiple receivers to share the same antenna without inter-action. Commercial availability and pricing direct from the firm.



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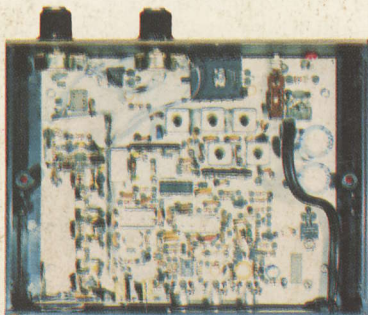
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